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OF THE AMERICAN DENTAL ASSOCIATION

JANUARY

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VOLUME 42

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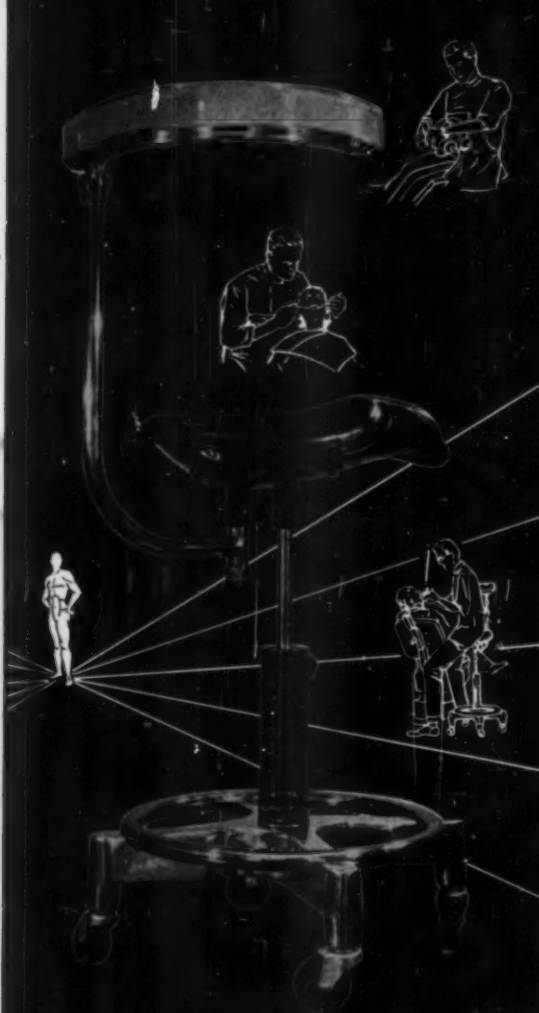

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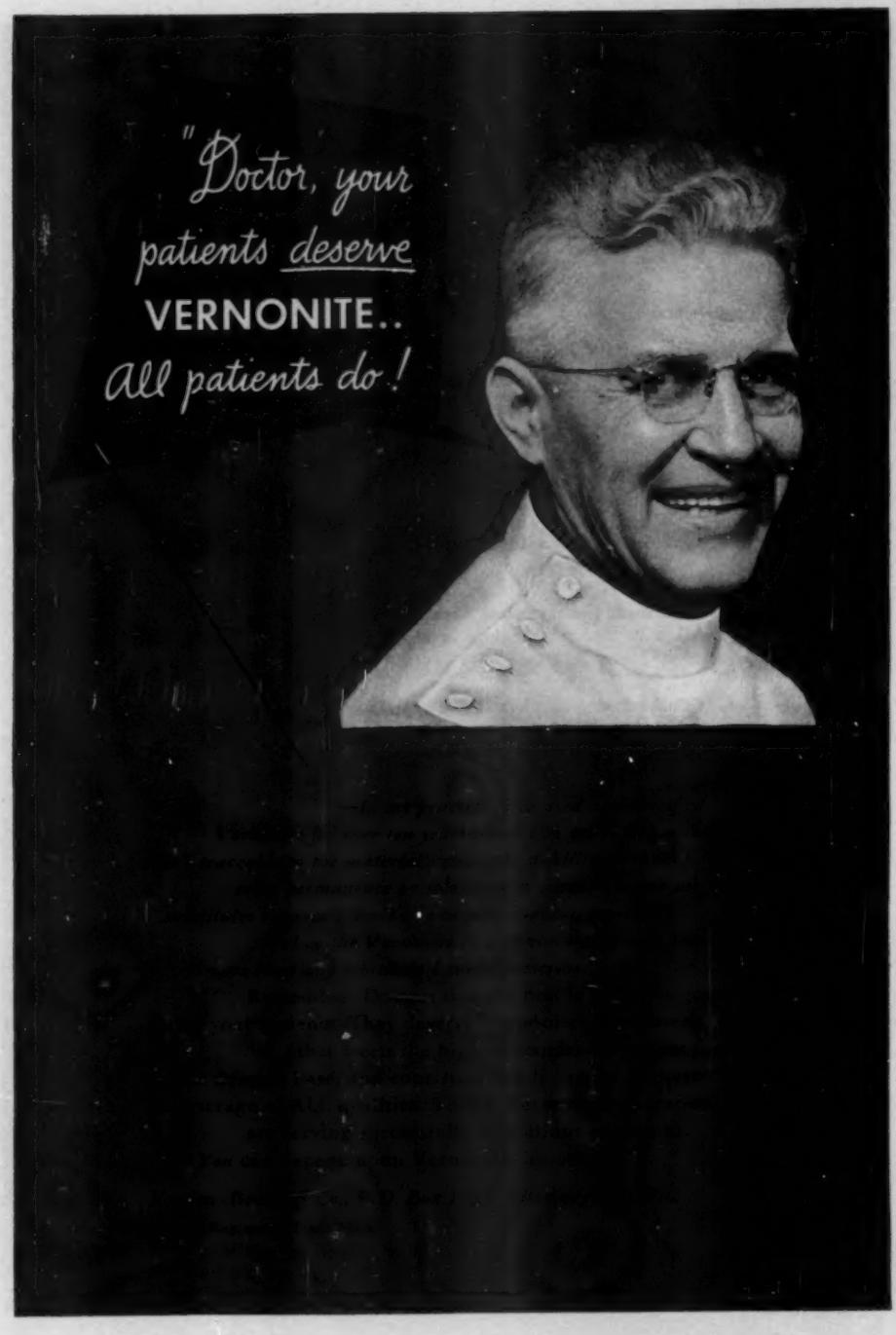
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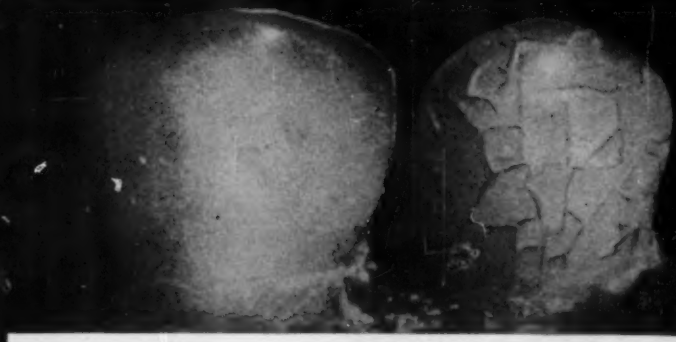

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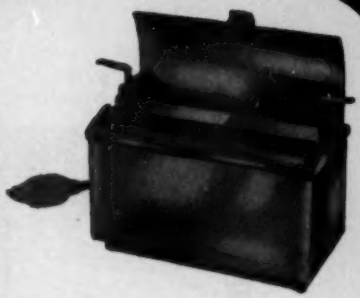

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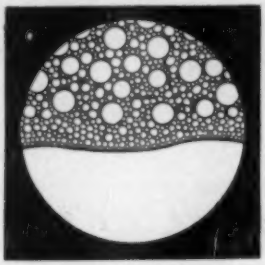

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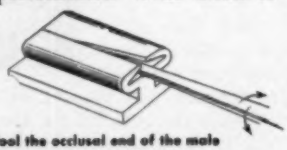

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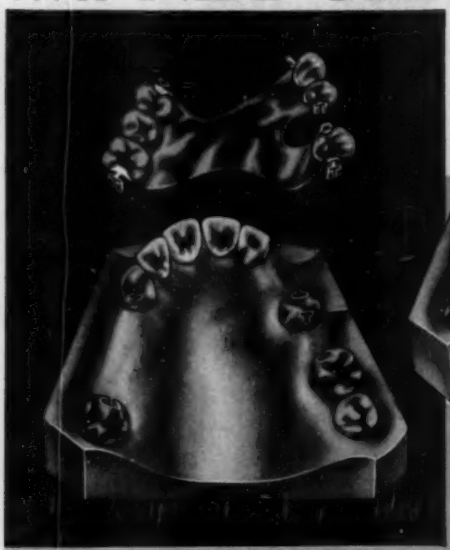

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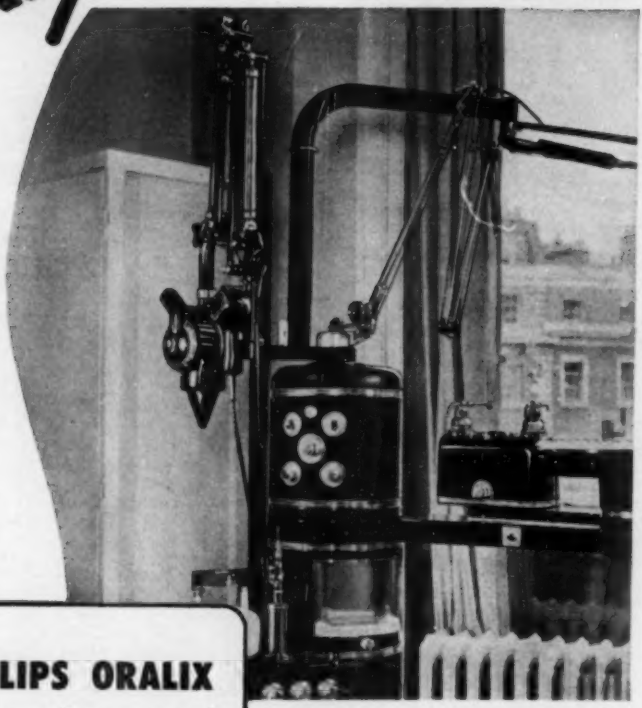

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*Stieglitz, E. J. *Nutrition problems of geriatric medicine.* J. Am. Med. Assn. *142*:1070 (April 8) 1950.

**Ohlson, M. A., Jackson, L., Boek, J., Cederquist, D. C., Brewer, W. D., and Brown, E. O. *Nutrition and dietary habits of aging women.* Am. J. Public Health *40*:1101 (Sept.) 1950.

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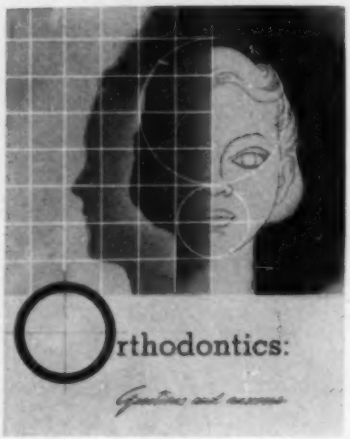

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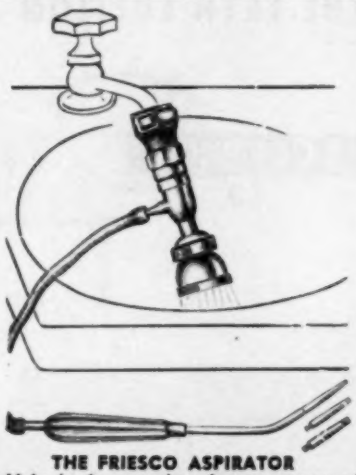

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* Fosdick, L. S., The Reduction of the Incidence of Dental Caries. I. Immediate Tooth Brushing with a Neutral Dentifrice, J.A.D.A. Vol. 40, No. 2, February 1950.

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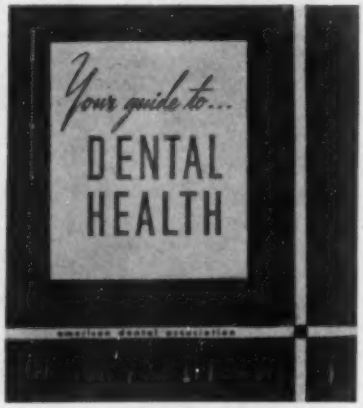

Why we have teeth	Abscess
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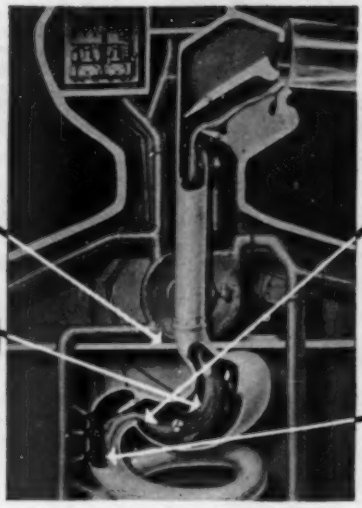

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1. *Effect of Buffering Agents on Absorption of Acetylsalicylic Acid.* *J. Am. Pharm. A., Sc. Ed.* 39:21, Jan. 1950.

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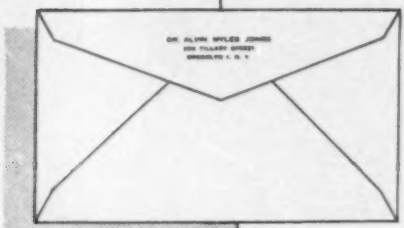

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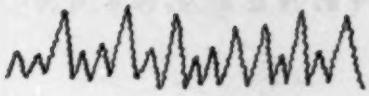

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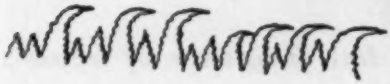

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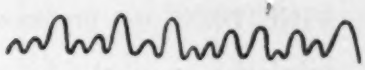

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THE Journal OF THE AMERICAN DENTAL ASSOCIATION

VOLUME 42 • NUMBER 1

Changes in the denture supporting tissues

Elbert C. Pendleton, D.D.S., M.D.S., Chicago

There appears to be a growing concern regarding the problem of changes in the denture supporting tissues of human jaws. Are these changes, observed both by clinical examination and microscopic study of tissue sections from edentulous jaws, solely caused by the support of a prosthetic appliance?

The normal and pathologic physiology of the oral tissues is well established. However, in spite of this knowledge, clinical interpretation of changes occurring in the mouths of edentulous individuals who wear some type of denture, almost without exception, is appraised on a mechanical basis. Generally these changes are attributed to stresses and strains resulting from wearing an artificial appliance.

Regardless of the recognized progress made in impression methods, registration of jaw relations, re-establishing the denture space, the choice and arrangement of artificial teeth and the processing and adjusting of the denture, changes persist in the tissues of edentulous jaws. Are these changes confined to tissues that support dentures?

This report deals with a study of biopsy material, secured from 126 edentulous subjects. The material was secured from individuals presenting conditions of varied character where correction had been recommended to facilitate construction and the subsequent success of prosthetic treatment. The region from which the biopsy specimens were taken involves the maxillary tuberosity and the labiobuccal surfaces and crest of the maxillary and mandibular ridges. In 39 cases the individuals, male and female, varying from 33 to 75 years of age had worn dentures for periods ranging from 6 months to 25 years. Histories of the patients were meager, inadequate and consistently unreliable. This inadequacy seemed to be the result of a lack of appreciation and a failure to be seriously impressed by past events related to health that directly or

The Department of Research, Loyola University School of Dentistry, Chicago College of Dental Surgery.

indirectly might affect this problem. All individuals were considered to be in a good state of physical health at the time the biopsies were taken.

The dentures were worn under varying conditions. Some of the patients wore partial dentures. Some wore complete maxillary dentures opposed by edentulous lower jaws, the six lower anterior teeth, many combinations of missing lower teeth or complete mandibular dentures.

Specimens were secured from many regions of the edentulous jaws; however, the most common source was the hyperplastic (pendulous) maxillary tuberosity. The tissue sections were prepared for microscopic examination in series cut in both the labiolingual and horizontal plane and were stained with hematoxylin-eosin, except in certain cases when orcein and Mallory stains were used.

Eighty-seven patients who had not worn dentures served as a control group and furnished specimens of tissue. These proved to be very illuminating by serving to remove doubt concerning findings that, with less compelling evidence, may have been looked on as just another of the unusual forms abounding in human tissue.

THE MUCOSA

Figure 1 illustrates a specimen selected from the control group as an example of normal oral mucous membrane. The tissue has cornified epithelium with regularly formed ridges (pegs)[1] of its deeper layers extending into the superficial layer (lamina propria) of the connective tissue. A granular layer of flattened cells containing granules (keratohyalin) supports the horny layer (Insert, Fig. 1). The connective tissue layers of the lamina propria; namely, papillary and reticular, usually may be identified microscopically by the direction of their collagenous fibers, when tissue sections are stained with specific dyes (Mallory's). The fiber bundles, except those forming the papillae, have a general direction parallel to the surface epithelium. In the deeper layers their arrangement is irregular, some fibers extending in all directions (Fig. 2). No focus of inflammation was observed.

The epithelium illustrated in the insert of Figure 2 is more nearly typical of the edentulous condition. It shows imperfect cornification (parakeratosis). Acanthosis, an increase in the number of cells and a thickening of the germinative, prickle cell, layer, is a condition commonly found in oral epithelium in the edentulous state. Also, the epithelial ridges often are enlarged (Fig. 3), blunt and shortened (Fig. 4) or elongated, appearing as proliferative outgrowths having irregular form (Fig. 5). Clinically, these manifestations usually are referred to as hypertrophic, but there seems to be some question as to the propriety of such a classification. It was Loeffler's[2] opinion, based on microscopic examination, that much of the material presented a perceptible increase in the size and number of cells in the germinative layer of the epithelium (acanthosis).

A condition so common that all material required decalcification before sectioning is illustrated in Figures 5 and 6 where remnants of a tooth root were found in the deep layers of the connective tissue of the mucosa. Such fragments, as well as isolated bone spicules, pervade tissue from edentulous jaws. Usually found in clusters, these calcified particles, commonly of microscopic proportions, invariably are free from inflammatory reactions, and are surrounded by actively regenerating cellular elements, young bone or cementum as the case may be. It is no exaggeration to refer to these calcified objects as a potential source of annoyance to their host when they lie in denture supporting tissues. A clinical ex-

1. Orban, Balint, Oral Histology and Embryology, ed. 2. St. Louis: The C. V. Mosby Company, 1949, p. 213.
2. Loeffler, Ernest, Personal communication.

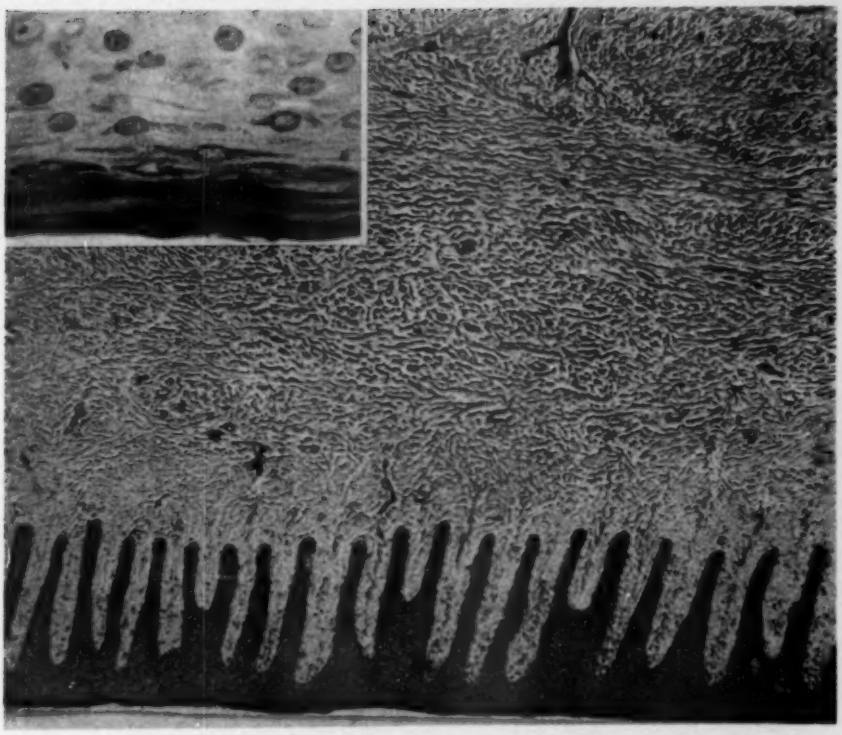

Fig. 1 • Upper right bicuspid area of a woman, aged 53. Denture not worn. Oral mucosa normal, cornified epithelium, pegs uniformly developed. Connective tissues free of inflammation, symmetrically formed papillae. Insert: Higher magnification of surface layers of the epithelium

perience frequently encountered is that patients complain of sore spots under a denture. There appears to be no visible sign of inflammation yet the complaint is genuine. Operators are prone to resort to the practice of relieving the denture in order to satisfy the patient of their willingness to be helpful but with little or no thought of the true nature of the complaint. M. M. House[3] called attention to this condition, recommending surgical removal of such irritations. This plan may not be the safe one to pursue in all cases because of the relation of the objects to other structures, such as their proximity to the maxillary sinus. Records reveal the existence of root fragments having been retained for many years without causing trouble, when, because of location, their removal would have presented a hazard.

The Epithelium • All transitional types of stratified squamous epithelium may be found in the mucosa of edentulous in-

3. House, M. M., From personal notes at a lecture before the Illinois State Dental Society, 1928.

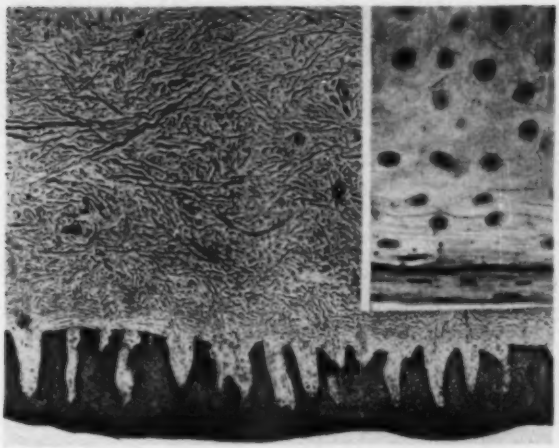

Fig. 2 • Upper left bicuspid area of a woman, aged 68. Dentures worn two years. Acanthosis, slight parakeratosis, collagenous fibers in connective tissue irregularly arranged and no inflammation. On the whole, the tissues show little or no change in the deeper layers of the mucosa. Insert: Higher magnification showing hyperplastic germinative layer and parakeratosis of the surface epithelium

dividuals: noncornified, parakeratotic and cornified. Orban[4] considered these forms of epithelium to be within the realm of normalcy when found in the gingival tissues. While parakeratotic epithelium commonly prevails at the residual alveolar ridge and in the denture bearing area of the vestibule in the edentulous mouth (Insert, Fig. 2), cornified zones often appear to be limited to the crest of the residual alveolar ridge (Insert, Fig. 10). However, most common are the areas where cornified and para-

4. Orban, Balint, Oral Histology and Embryology, ed. 2. St. Louis: The C. V. Mosby Company. 1949. p. 218.

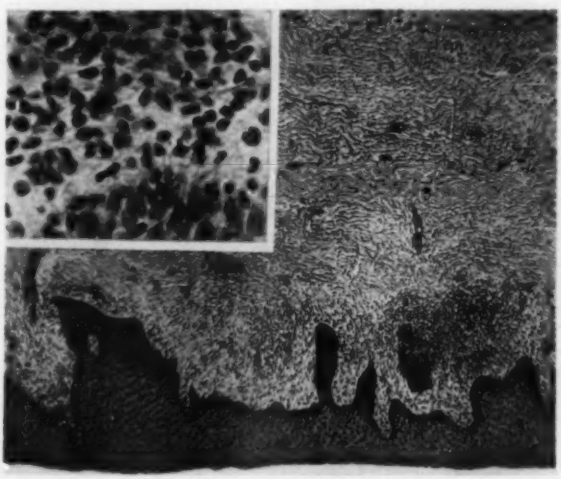

Fig. 3 • Upper right first molar area of a man, aged 49. Denture worn five years. Shows acanthosis, parakeratosis, subepithelial inflammation. Insert: Higher magnification of basal layer of epithelial cells and subepithelial infiltration of lymphocytes and plasma cells

keratotic epithelium appear alternately in the same field of a given tissue section. An example of the variability and proximity of transitional forms of the oral epithelium is illustrated in Figure 7 where a zone of hyperkeratotic surface epithelium with multiple layers of granular cells terminates abruptly and continues as parakeratotic epithelium. Hyperkeratosis is not confined to denture-wearing individuals as may be seen in Figure 8 which shows an extreme condition of similar character from a person where no artificial appliance had been worn. It may or may not be significant that the mucosa in both cases was free from inflammation, thus suggesting leukoplakia, a disease only rarely surrounded by an inflammatory zone (Thoma).[5]

Mechanical influences are recognized for the important role they play in tissue change. In tissues serving movement and support, the inciting cause of tissue change is chiefly mechanical (MacCallum).[6] According to Orban[7] the morphological structure of mucous membrane varies according to the mechanical influence and the function of the special areas in the oral cavity.

A series of sections from the midline including the first bicuspid region from the left side of the lower jaw of a woman, 33 years of age, who had worn dentures five years, shows a typical acanthosis with parakeratotic epithelium prevailing throughout the region (Fig. 9). The right side of the arch of the same individual shows comparable changes (Fig. 5). Variability may be noted in the character

5. Thoma, Kurt H., Oral Diagnosis With Suggestions for Treatment. Philadelphia: W. B. Saunders Company, ed. 2, 1943, p. 291.

6. MacCallum, W. G., A Textbook of Pathology, ed. 7. Philadelphia: W. B. Saunders Company, 1940, p. 183.

7. Orban, Balint, Oral Histology and Embryology, ed. 2. St. Louis: The C. V. Mosby Company, 1949, p. 211.

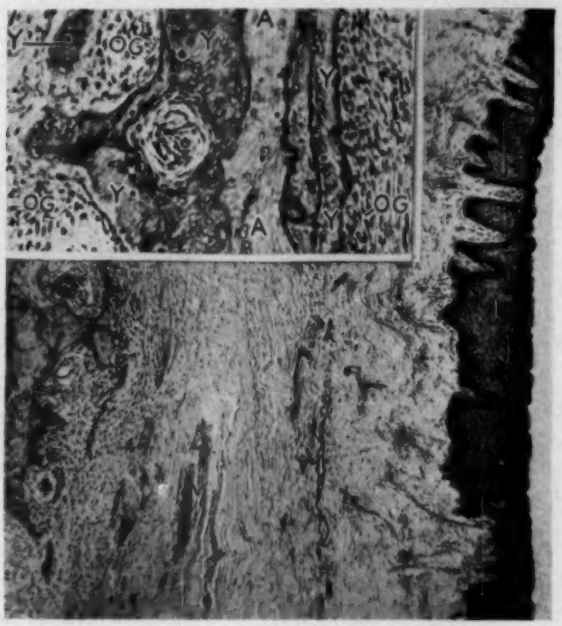

Fig. 4 • Labiobuccal surface of residual alveolar ridge at upper left molar region of a woman, aged 69, who had worn dentures six years. Shows broad, blunt epithelial pegs and irregular parakeratotic epithelial surface layer. No inflammation present. Repair of the bone was very active at the outer and inner surfaces. Insert: Higher magnification showing apposition of young bone at labiobuccal surface. A: Adult bone. Y: Young bone. OG: Osteogenic cells

of the epithelial surface layer from another person. The insert in Figure 10 is a higher magnification taken from Figure 10 showing cornified epithelium at the crest of the residual ridge. Figure 4, from the same individual, presents a prevailing parakeratotic condition at the labiobuccal surface of the ridge where the tissues approach the line of reflection. Might the character of the epithelium of these closely associated areas suggest that the difference in their quality resulted from functional or mechanical influences to which they were subjected? This, then, could be interpreted as evidence of functional adaptation to a specific type and concentration, in particular directions, of mechanical stimulation. It may be assumed that the tissues shown in Figure 10 and insert were highly stimulated by intermittent horizontal forces (Gysi)[8] favorable to the production of a horny epithelial surface but of an intensity sufficient to cause irritation and produce localized zones of a subepithelial inflammation. The tissues shown in Figure 4 may have been subjected to a shearing force resulting from the rim of the denture rubbing, for a considerable length of time, with slight vertical pressure which caused imperfect cornification (parakeratosis), but with not enough pressure to incite inflammation.

The factor of tolerance must not be overlooked in the consideration of tissue

8. Gysi, Alfred. Practical application of research results in denture construction. J.A.D.A. 16:220 (Feb.) 1929.

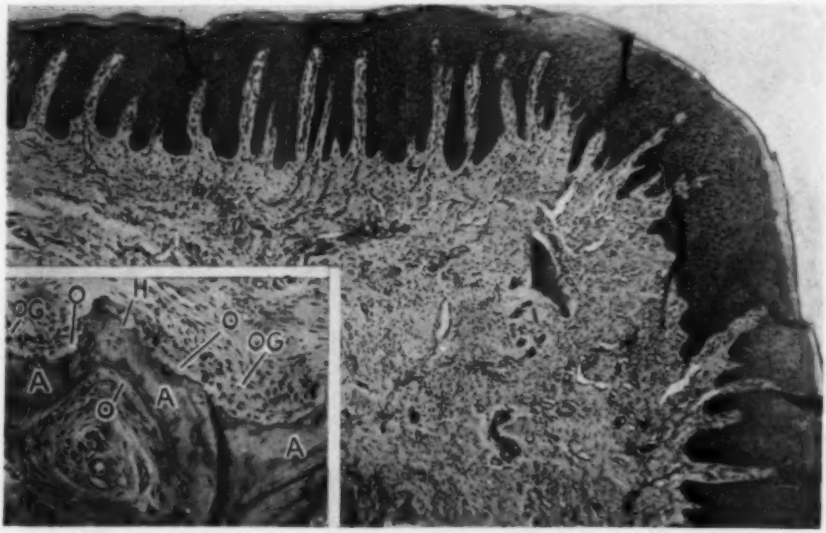

Fig. 5 • Lower right cuspid area of a woman, aged 33, who had worn dentures five years. The epithelium was parakeratotic and the pegs show irregularly shaped outgrowths together with some that appear quite broad. A colony of calcified particles is located in the connective tissue that showed little or no inflammation. Insert: Higher magnification showing terminal line of resorption at outer surface of the bone with band of osteoid tissue and a similar reinforcement at the inner surface. A: Adult bone. O: Osteoid tissue. OG: Osteogenic Cells. H: Howship's lacunae

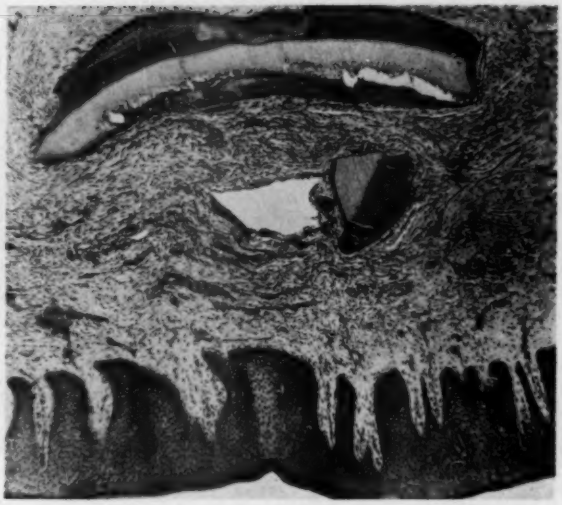

Fig. 6 • Acanthosis and parakeratosis of the epithelium from the upper left molar region of a woman, aged 48, where a denture was not worn. Particles from a tooth root are shown in the connective tissues

change. It is well established that certain stresses and strains applied to tissues under some conditions cannot be tolerated while under other circumstances they may be borne with convenience. Physical health plays a dominant role in the response of body tissues to mechanical stimulation. Thoma[9] sums up the problem well, "General health is important. Disease processes due to metabolic disturbances, deficiencies, and endocrine imbalance affect both the oral mucosa and the underlying bone."

If it is permissible to take the position that "the exception proves the rule" then Figure 11 should contribute some evidence to support the premise that environment also has a considerable influence on the response of tissue to functional stress. A denture had been worn 12 years by an individual 69 years old with no evidence of change in the supporting tissues. The epithelium in all of the serial sections presented a cornified surface throughout the region of the residual ridge. Changes in the tissues common to denture wearers were conspicuously absent regardless of the advanced age of the patient and the length of time that dentures had been worn. It would appear that the environment was congenial to denture support. The state of the patient's general health was good, masticating forces were in a direction, at an intensity and of duration within the range of tissue tolerance.

The Connective Tissues • The two layers of the lamina propria, papillary and reticular, and the submucosa seem to be extremely tolerant of stresses imposed by wearing dentures. Their character, quality and distribution contribute to their dominance as factors in denture support. The mechanical function of loose connective tissue is to act as a medium supporting and surrounding the elements of other tissues. The flexible collagenous fibers of the connective tissue allow a more or less distinct movement of the

9. Thoma, Kurt H., Oral Diagnosis with Suggestions for Treatment. Philadelphia: W. B. Saunders Company, 1936, p. 254.

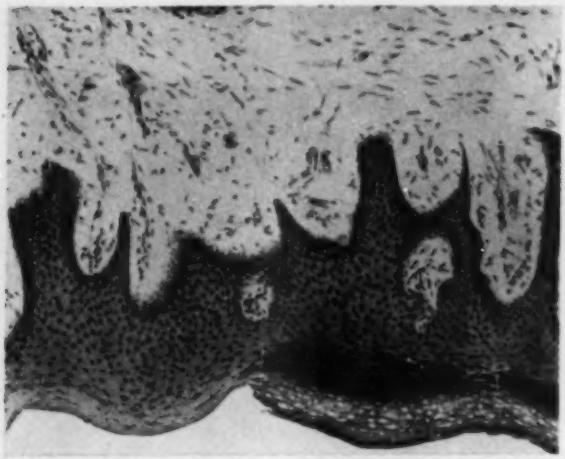

Fig. 7 • Upper left retro molar region of a man, aged 54, who had worn a denture six months. The epithelium shows hyperkeratosis and parakeratosis. There was no inflammation in the connective tissues

connected parts in relation to one another.[10] Connective tissues, in which fat cells play an important role, have mechanical potentials which may account for the apparent lack of change observed in the edentulous state.[11] It seems quite impossible to determine what effect if any, other than inflammatory, denture support has on the deeper tissues of the mucosa. It appears that the quality, that is the form and character, of the collagenous fiber bundles may be affected by mechanical stimulation. Fat-containing loose connective tissue with blood vessels may be found infiltrated by inflammation (Fig. 12). The fiber bundles appear somewhat more dense in character and of greater dimension than those commonly observed in the tissue from edentulous jaws (Insert, Fig. 12). It could not be determined whether this change was caused by a pathologic state of the tissues incited by mechanical injury.

Elastic fibers usually limited to the loose connective tissues in the region of the labiobuccal vestibule, appear to be more abundant, of stronger character and to approach the crest of the residual ridge in cases where dentures were worn. This alteration in the distribution of the elastic fibers could not be demonstrated conclusively. However, elastic fibers are common to tissues subjected to tension. It appears possible that changes in the type of mechanical action imposed upon denture bearing tissues could affect their quality. Even with slight though questionable evidence, some basis may exist for future studies of what at present must be recognized as theory.

RESIDUAL ALVEOLAR BONE

Changes in the form of the bone in edentulous jaws has attracted operators who render denture service. There seems to be no reason to assume that the morphologic reaction of the hard tissues of the jaws varies in any fundamental particular from that in other parts of the human body. It is granted that residual

10. Maximow, A. A., and Bloom, William, A Textbook of Histology. Philadelphia: W. B. Saunders Company, 1938, p. 57.

11. Pendleton, Elbert C., The oral mucous membrane as a denture supporting structure. The Bur 40:20 (March) 1940.

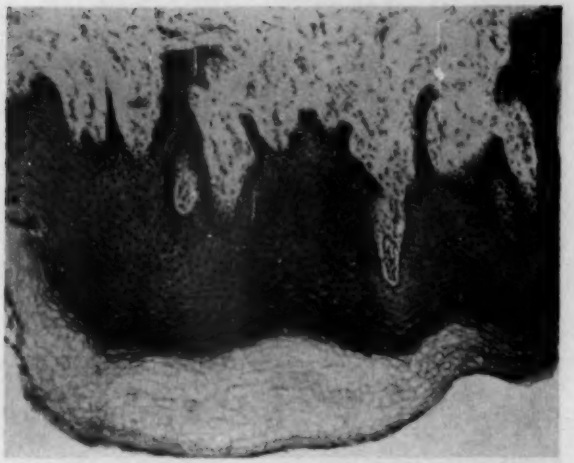

Fig. 8 • Hyperkeratosis from upper right retromolar region of a man, aged 64. Denture not worn

alveolar bone may be subjected to stresses and strains to which it was unaccustomed at the time it served as the support of the natural teeth. Such change in environment, usually coming at a time when adjustment to new conditions is difficult, places an added burden on tissues often taxed by depleted health factors in making what may require a radical adjustment in functional habits. Whether the cause or causes of change in the bone is mechanical, biologic or both is uncertain.

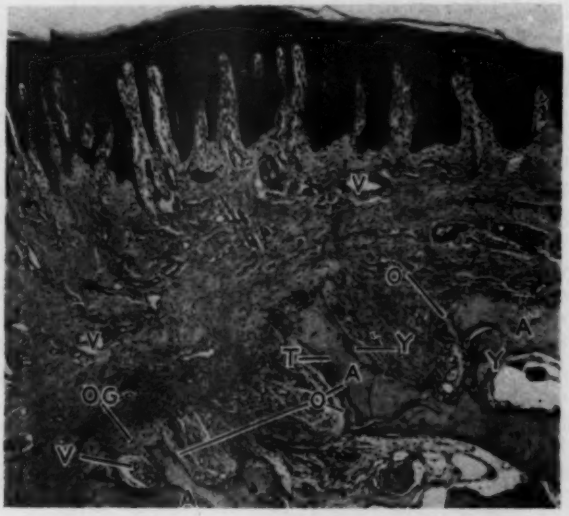

Fig. 9 • Acanthosis, parakeratosis and proliferative outgrowths of the epithelium and repair of the residual alveolar ridge at the central incisor region of the left side of lower jaw of a woman, aged 33, who had worn dentures five years. The connective tissues were highly vascular but no inflammation was present. A: Adult bone. T: Terminal resorption line. Y: Young bone. O: Osteoid tissue. OG: Osteogenic cells. V: Blood vessels

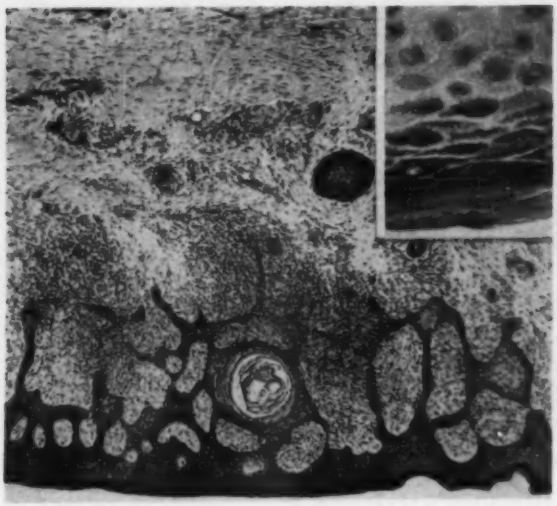

Fig. 10 • Mucosa from the residual alveolar ridge at the right maxillary molar region, showing outgrowths of the epithelial pegs and subepithetial infiltration, of a woman, aged 69, who had worn dentures six years. Insert: Higher magnification showing cornified epithelium

Clinical research points an accusing finger at debatable procedures used in practice that subject tissues of the denture area to abuse. Such treatment may be the use of artificial teeth that are unsuited to the individual condition; methods used in taking impressions, and making casts creating "placement"; or it may consist of ill-advised compression of the soft tissues; beading; relief, and failure to secure casts which reproduce a relation of the jaws to each other, normal to the individual. Any one or a combination of these factors may create a hazard to the functional equilibrium of the denture supporting structure.

Weinmann and Sicher[12] state that, as yet, it has not been explained successfully how mechanical forces stimulate the apposition of bone or how the lack of function brings about bone resorption. Bone is designed to withstand forces in a certain direction. Those stresses within the limits of tolerance act to stimulate bone apposition if applied to particular regions and in a direction that can be regarded as intensified normal forces. If pressure is applied to bone which normally is under tension or if a force is applied in a direction which deviates from the normal, bone resorption will follow. Forces of great intensity that exceed limits of tolerance, whether they exert pressure or tension, will lead to tissue destruction.

Gysi[13] demonstrated that vertical biting force directed against an oblique surface produces a horizontal thrust. Therefore it would appear that the denture supporting bone may be affected by adverse forces proportionate to the degree of inclination of tooth surfaces.

In the lower jaw of a 33 year old individual who had worn complete maxillary and mandibular dentures for five years, apposition of new bone is seen on the left side of the arch from the midline including the bicuspid area (Fig.

12. Weinmann, Joseph P., and Sicher, Harry, Bone and Bones, Fundamentals of Bone Biology. St. Louis: The C. V. Mosby Company, 1947, p. 121.

13. Gysi, Alfred, Practical application of research results in denture construction. J.A.D.A. 16:221 (Feb.) 1929.

9). On the right side there appears to be somewhat less activity. From some undetermined cause, the proliferation of the connective tissue cells and apposition of new bone appear retarded to a degree slightly more than on the opposite side of the arch (Fig. 5).

The terminal line of resorption (reversal line) is plainly marked at the outer surface of the adult bone by Howship's lacunae (Insert, Fig. 5). As this outer structure was resorbed a reinforcement of the internal bone surfaces was taking place. This apposition was seen in all of the sections of the series as a band of osteoid tissue. A similar layer of osteoid tissue was laid down in the Howship's lacunae at the outer surface.

The repair of bone lost by resorption was in evidence wherever bone was found in the material studied. The subjects selected for illustration were considered

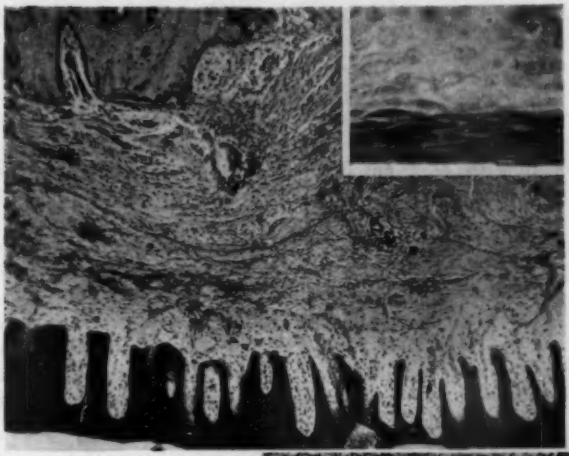

Fig. 11 • The patient, a woman, aged 69, had worn dentures 12 years. Some local inflammation was present. Changes in the tissues common to denture wearers were conspicuously absent. The epithelium showed a cornified surface layer. Insert: Cornified surface layer at crest of ridge

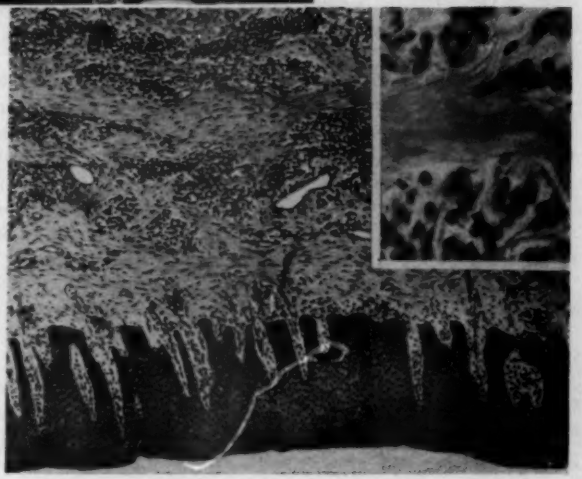

Fig. 12 • Ancanthosis, parakeratosis and thickened outgrowths of the epithelium are supported by dense bundles of collagenous fibers in highly infiltrated loose connective tissue surrounding blood vessels of a woman, aged 69, who had worn dentures 6 years. Insert: Higher magnification of zones of inflammation and dense collagenous fibers

representative. It is well known that the general concept held in relation to the reaction of the jaws to the support of dentures is one of bone degeneration and destruction. Assuming that the illustrations presented in this report can be considered as evidence, it seems certain that, other factors being equal, bone is one of the most active of the body tissues in the repair of structure lost by resorption. "Despite its passive character, bone is highly sensitive to alterations of its normal mechanical function as well as toward certain metabolic changes in the body as a whole."[14] It can not be said that age and the length of time dentures have been in service are an impediment to bone apposition (Insert, Fig. 4). While repair was taking place at the labiobuccal surface of the residual ridge in one case, another showed similar activity in two magnifications illustrating repair at the ridge crest. Ham[15] found that bone formation in repair was closely associated with vascularity (Fig. 13).

INFLAMMATION

According to MacCallum[16] inflammatory reactions vary with the kind of tissue involved and the intensity and concentration of the irritant. Because of the dense character of the covering of the residual alveolar ridge, under general conditions, these tissues seem to be quite resistant to irritating influences imposed by dentures. It is when the health of the tissues becomes impaired and the stresses imposed are too great or in adverse direction that injury occurs.

Inflammation appears to be very common to the mucosa of the control group, those where no dentures had been worn for a period of some two or three months after the natural teeth had been extracted. Later the inflammation seems to be less in evidence. Lymphocytes and plasma cells predominate in the inflamed areas. These cells usually congregate in colonies along the course of the blood vessels when found in the deeper layers of tissue (Fig. 14). In the superficial tissues they invade the intercellular spaces (Insert, Fig. 16) and infiltrate between the bundles of dense collagenous fibers (Insert, Fig. 12). Where dentures have been worn, focal infiltration commonly appears to be of a subepithelial type and is usually well localized (Fig. 3). It is seldom of a general character.

The inflamed zone may be near the crest of the residual ridge associated with cornified surface epithelium (Fig. 10) or it may be at the vestibule accompanied by interepithelial and intraepithelial edema so intense that few epithelial cells survive even in cases where a denture was not worn (Fig. 15). A less intense infiltration with edema, likewise associated with parakeratotic epithelium, was present in the tissues of a woman, aged 76, who had worn a denture for 25 years (Fig. 16).

This low grade inflammation of the mucous membrane appears not to be limited by sex, age or whether dentures were worn. It could not be established that a relation existed between the processes of inflammation and resorption or between inflammation and the apposition of new bone.

CONCLUSION

Changes in the denture supporting tissues of the human jaws, in the main, appear to be caused by some type of injury. Whether transformations resulting from mechanical influences were affected by biologic factors could not be definitely determined. Surely they were subject to conditions of health and disease that play an important role in tissue reac-

14. Maximow, A. A., and Bloom, William, A Textbook of Histology. Philadelphia: W. B. Saunders Company, 1938, p. 140.

15. Cowdry, E. V., Special Cytology, Volume II, ed. 2. New York: Paul B. Hoeber, 1932, p. 1019.

16. MacCallum, W. G., A Textbook of Pathology, ed. 7. Philadelphia: W. B. Saunders Company, 1940, p. 228.

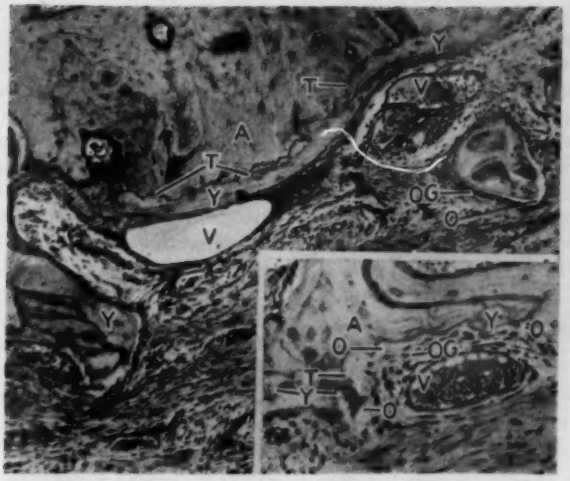

Fig. 13 • Companion of Figure 11 showing bone repair at the crest of the residual ridge in areas of vascularity of a woman, aged 69, who had worn dentures 12 years. Insert: Higher magnification of zone of repair in another field from that shown in accompanying figure. A: Adult bone. T: Terminal resorption line. O: Osteoid tissue. OG: Osteogenic cells. V: Blood vessel. Y: Young bone

tions to injury. The most conspicuous changes in the oral structures observed on clinical examination are presented by the character, condition and form of the mucosa and its supporting bone. Microscopic examination of serial sections of these structures from the living subject tends to complete the picture by making possible an analysis of their elements, cells and intercellular structure.

The most striking changes in the mucosa appeared in the epithelium where the surface layer, consistently parakeratotic, on occasion, presented zones of cornification at the ridge area. Transitional forms in the surface epithelium

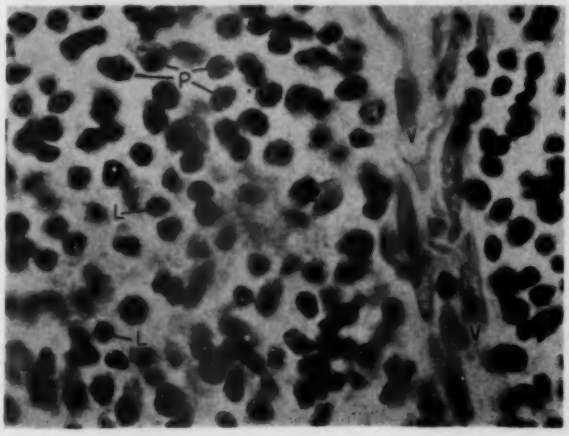

Fig. 14 • Inflammatory exudate cells (lymphocytes and plasma cells) in loose connective tissue along course of blood vessels of a woman, aged 48, who did not wear dentures. V: Blood vessel. L: Lymphocyte. P: Plasma cell

were common. Variations in the character of the surface layer were often found closely associated in the same field of a microscopic section. Changes in the deeper layers were consistent. Thickening of the germinative layer appeared common, with few exceptions, in edentulous tissues. Proliferative outgrowths of the epithelial ridges were found in many varying forms. Inflammation of a subepithelial type prevailed. However, where the deeper tissues were invaded the inflammatory cells followed the course of the blood vessels or inhabited the loose connective tissue between the bundles of collagenous fibers.

Dominating every other observation were the findings common to all edentulous tissues irrespective of whether they had or had not supported dentures.

Fig. 15 • Inflammation with edema at the vestibule where no dentures were worn by the patient, a woman, aged 29. Shows degeneration of epithelial cells

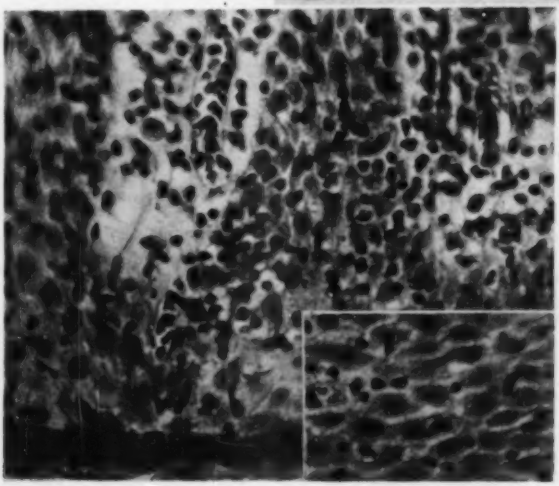

Fig. 16 • The patient, a woman, aged 76, had worn dentures 25 years. Edema is shown in epithelium at cuspid region of maxillary denture area. Insert: Higher magnification of inflammation of intercellular spaces in germinative layer of epithelium

The bone presented evidence of two distinct reactions: resorption and repair. Regardless of the location of the terminal line showing where resorption concluded its destruction, activity in the surrounding connective tissue cells together with the formation of a band of osteoid tissue testified to the efforts of nature in restoring or at least repairing the damage. Reinforcement of the internal structure of the bone was evident in every instance where the outer surface had been affected by resorption. This apposition of bone should not be considered as a process of growth but rather as one of regeneration or repair. Wherever tissues are damaged by some type of injury, agencies, far more potent than might be suspected, are active in restoring them to functional usefulness.

Comparable changes in the epithelium, connective tissues and bone are common to edentulous jaws. Changes common to denture wearing individuals were equally prevalent in cases where no form of prosthesis had been worn. The age of the individual and the length of time dentures were worn appeared to be no barrier to the processes of regeneration and repair.

A study of centric relation as recorded in a supine rest position

William Roy Eberle, D.D.S., Chicago

Nothing is of greater importance in the study and practice of dentistry than a clear understanding of the centric relation in the temporomandibular articulation. Nothing in dental procedures is more basic than the ability to recognize and record this relationship exactly. To the orthodontist and periodontist it is the starting point of diagnostic analysis. To the prosthodontist it is the position from which all functional motions gyrate. Any aberration in this relationship, whether in natural dentition or artificial restoration, obviously precludes the possibility of a balance in any functional position.[1]

For one hundred years, dentistry has advanced by supplanting the artisan rule of thumb with a better perception of scientific method. The beeswax mush bite of the last century was followed by "bites" of many kinds. Bizarre methods of securing the proper "bite" varied from a hard swallow to a walk around the room. Unconsciously perhaps, many of the methods were founded on principles that would secure to some degree a relaxed or balanced condition of the muscles as exemplified by the "no bite" method of the Greene brothers[2] and the many technics based upon palpitation of the temporal muscle.

After World War I hard baseplates, or compound biterims, became popular

1. Stuart, Charles E., Articulation of human teeth. D. Items of Interest, 61:1029 (Nov.) 1939.

2. Greene, Jacob, Greene Brothers Dental Prosthesis. Detroit: Detroit Dental Mfg. Co., 1916.

and the term centric occlusion began to replace "the bite" in dental literature.[3] Intraoral and extraoral contrivances of many kinds were invented and introduced. Tracing devices designed to record centric relation as the most retruded position of the mandible created disagreement because many believed a so-called functional centric relation to be slightly to the anterior. This misunderstanding was caused probably by a conditioned reflex of the masticating muscles from a previous chewing habit. This habit reflex set up a rather constant spot for the mandible to return to, that might be termed a pseudo-centric relation. With the patient in an upright position, as will be shown later, it was particularly easy to record this reflex functional location as the true centric relation.

No method was developed that would definitely test the correct tenet, and it is plausible that much of the lack of agreement was caused by these conditioned reflexes, technical faults and tissue movement. It also was certain that much of the exactness of any of the schemes was lost during fabrication. Despite careful processing, stabilized baseplates and split casts, there remained a measurable error, sometimes as much as ⅛ inch for each base, between the way the base would fit the cast and the way it would fit the tissue.

According to the definition of the National Society of Denture Prosthetists as published in 1930,[4] "the mandible is in centric relation when the heads of the condyles are in their most retruded position from which the jaw can make free lateral movements." Although this definition is acceptable it stops short of complete clarity. Centric relation exists in many degrees of jaw separation. Any location on the arc of simple axis movement where the condyles are neither consciously pulled or unconsciously forced from their most retruded position in the socket may be said to be centric relation. The problem clearly appears to be the general introduction of some simple but dependable plan to check centric relation both of the natural dentition and the completed prosthetic restoration. Wax check-bites are used chiefly now but reports show they are difficult to handle and that the results from their use are uncertain in other than experienced hands.[5] Furthermore the dimensional instability of waxes makes them unreliable. Every dentist has experienced misgivings

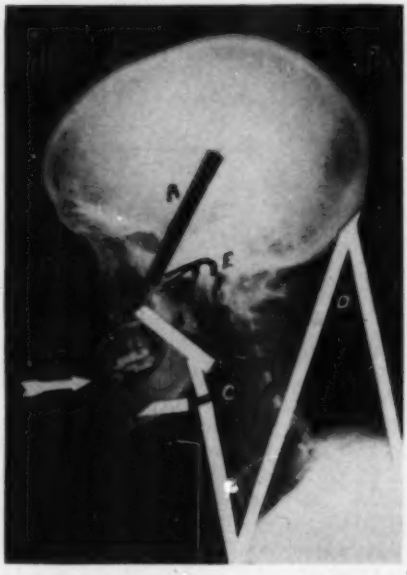

Fig. 1 • Roentgenogram of head with mandible at rest position. Muscle support of the head is shown by diagram. A: Temporal muscle. B: Masseter muscle. C: Hyoid bone and supra- and infrahyoid muscles. D: Sternocleidomastoid and other muscles attached to back of head. E: External pterygoid muscle and meniscus. Arrow points to freeway space

3. C[illegible]bell, Dayton Dunbar, Full Denture Prosthesis. St. Lo[illegible] C. V. Mosby Co., 1924.

4. Report by the national society of denture prosthetists. J.A.D.A. 17:1123 (June) 1930.

5. Trapozzano, V. R., A comparison of the equalization of pressure by means of the central bearing point and wax check bites. J.A.D.A. 38:586 (May) 1949.

in making wax bites but he also has realized the impracticability of using tracing devices on the finished restoration.

The problem of obtaining accurate centric relation has two equally important phases: (1) physiological—getting the mandible into the desired location and (2) technical—transferring the relationship exactly to a suitable instrument.

PHYSIOLOGIC REST POSITION

In a study of the physiology and kinematics of the mandible, the importance of the rest position becomes immediately apparent. Although it is a nonfunctional position, it is the start and terminal of all functional movements. Because of varying tissue changes, it is the only enduring landmark to guide the dentist to an optimum occlusion. It is also the most comfortable and the most retruded position of the mandible. First mentioned in literature by Niswonger,[6] its importance was pointed out by Thompson[7] and its clinical application was demonstrated by Gillis[8] and Holic.[9]

Thompson and Brodie[10, 11] have shown the constancy of this jaw position from the third month of postnatal life to edentulous old age. Reflexes in the neuromuscular mechanism of the head and neck produce a constant relation throughout life between the mandible and the maxilla. This preordained and constant characteristic of the individual provides a fixed space between the rest position and the occlusal contact known as the freeway space. Any obliteration of that fixed space by bite raising is believed to be of a hazardous nature.

It is outside the scope of this study to discuss the complex mechanism of muscle action. For our purpose it is sufficient to understand that the rest position of the mandible is part of the posture scheme of the head. The cranium is supported by a chain of muscles as shown in Figure 1, and the masseter, temporal and hyoid muscles are links in that chain. The erect position of the head does not happen by conscious effort, but is maintained by stato-tonic reflexes by which some of the muscle fibers are constantly in action while most of them are resting. These stato-tonic reflexes are most highly developed in the group of muscles which resist gravity and this constant state of partial tension is known as tonus. The tonus of these antigravity muscles attached to the mandible produces the equilibrium of the head. The physiologic rest position is a natural reflex position. Any other position the mandible assumes is a functional one. Centric occlusion is a functional position.

Investigators in this field have uncovered impressive evidence that the optimum occlusion of teeth, whether natural or artificial, should be 3 to 4 mm. (at the incisors) above the rest position.[7, 10] Any attempt to reduce this natural freeway space could result in interference of tongue and speech and a final ruinous resorption of residual alveolar bone. The rest position of the mandible is an extremely valuable landmark.

HINGE AXIS

One of the curious realities in the study of gnathodynamics is the distance that dental science, and particularly prosthodontia, has traversed without taking into more serious consideration the hinge or axis movement. The hinge-axis movement is a component of every motion of the mandible and from a mechanical as-

6. Niswonger, M. E., The rest position of the mandible and centric relation. J.A.D.A. 21:1572 (September) 1934.

7. Thompson, J. R., The rest position of the mandible and its significance to dental science. J.A.D.A. 33:151 (Feb.) 1946.

8. Gillis, R. R., Establishing vertical dimension in full denture construction. J.A.D.A. 28:430 (March) 1941.

9. Holic, Richard, Centric registration in full denture construction. J.A.D.A. 36:296 (March) 1948.

10. Brodie, A. G., On the growth pattern of the human head from the third month to the eighth year of life. Am. J. Anat. 68:209 (March) 1941.

11. Thompson, J. R. and Brodie, A. G., Factors in the position of the mandible. J.A.D.A. 29:925 (June) 1942.

Fig. 2 • Recording the exact axis. The adjustable stylus is cemented firmly by a clutch to the mandibular teeth and the writing plate is cemented in the same way to the maxillary teeth. By trial and error the exact axis is fixed and tattooed on the skin

pect is of considerably more importance than the inclination of the articular surface of the glenoid fossa which has received almost obsequious consideration.

From a cold mathematical precept the securing of a precise centric occlusion in full denture restorations is improbable without recording the true axis. Personal adaptation and tissue adjustment, fortunately for the prosthodontist, usually compensates for small dimensional errors.

Two generations ago, Gray,[12] in his classic work on anatomy, clearly described the temporomandibular articulation as two distinct joints, one the definite slide of the meniscus on the articular surface of the temporal bone, and the other, the definite traverse axis hinge-like movement of the condyle head in the meniscus. The axis in this sense is conceived as an imaginary line which is a pivot point of all motion. The fixing of such a point is fundamental in a three dimensional observation and recording of the kinematics of any body, system or mechanism.

Prothero and others recognized the importance of the axis, but no articulator or face-bow was developed that could make more than a token use of the factor. Gysi, at one time, conceived the axis, if it existed (sic), as in the hyoid region of the mandible. Munson placed the center of motion as four inches above the plane of occlusion which germinated the spherical theory of occlusion. Investigators, in their search for the center of motion, were confused by the multitude of motions and the erratic glide of the two interdependent condyles, and frequently conceived the joint as operating like a cushion without track or design.

Without considering this vital component of motion, attempts were made to resolve the very individualistic complex motions to a mechanical or mathematical formula. The hinge movement was disputed or overlooked. Since the hinge movement exists in every other joint in the body, it seems fantastic to concede that the mandible is without one. With a series of experiments, beginning in 1921, B. B. McCollum[13] and associates demonstrated the constant presence of a definite hinge-axis movement and reported:

> We have proved to our entire satisfaction that the mouth may be opened as much as one-half inch in the incisor region in every case and in some cases as much as an inch without compelling the condyle heads to move forward in the fossae, as happens in opening the mouth wide.

This statement has been confirmed many times by personal clinical observations with an adjustable face-bow securely cemented to the mandible (Fig. 2).

SUPINE REST POSITION

The ultimate value of any scientific inquiry is its practical application to a specific problem. The application should be as simple as possible to secure the greatest benefit. We have established that:

12. Gray, Henry, Anatomy of the Human Body, ed. 23. Philadelphia: Lea & Febiger, 1936, p. 291.

13. McCollum, B. B., Fundamentals involved in prescribing restorative dental remedies. D. Items Interest, 61:522, 641, 724, 852, 942 (June-Oct.) 1939.

1. The condyles are in their most retruded position in the glenoid fossae when the mandible is in the rest position.

2. The optimum space between the rest position and centric occlusion is 3 to 4 mm. (at the incisors).

3. The movement of the relaxed mandible for at least one-half inch is a simple hinge movement.

4. The movement of the relaxed mandible from the rest position to centric occlusion is a simple hinge movement.

Thus we have a series of physical constants which seem surprisingly orderly and uncomplicated. The capturing of these relations without disturbing the delicate relaxed position of the mandible is the crux of the problem. When the head is erect the tonus of the muscles above and below the mandible may be compared to slightly taut rubber bands and the slightest effort on the part of the patient to bite (the conditioned reflex) may glide the mandible to an eccentric position (Fig. 1). The suspension moreover is so delicate that attempting to lock baseplates with cleats, plaster or a hot spatula can easily push the jaw several millimeters laterally, a distance to which most tissues cannot adapt themselves.

The four pterygoid muscles are most commonly held responsible for deflecting the mandible from centric relation. The external pterygoid muscles, particularly, pull the condyles forward almost at right angles to the antigravity muscles. It appears logical that if some means were used to control the action of the pterygoid muscles and a technic arranged which would automatically freeze the relationship and yet call for no effort on the part of either the patient or the operator, it should prove useful. Anesthesia of these muscles is, of course, not feasible but we can use gravity, fatigue and sedatives.

Since gravity is a constant and available force, it has been used to advantage in what is called the supine rest position. The patient is placed in a reclining relaxed position, with the head rest below the occipitalis so that the head is thrown slightly back (Fig. 3). Note the roentgenogram in this position with a diagram of the muscle action (Fig. 4). The antigravity muscles, now resting because the head is supported, are stretched on each side of the mandible like guy ropes on a tent pole, holding the mandible down. The mandible is directly above the fossae and the external pterygoid muscles are discouraged in any attempts to lift the jaw from this most retruded natural position by both gravity and the pull of the other muscles. The external pterygoid muscles in this position must pull directly against the force of gravity. The patient is instructed to relax thoroughly and to open and close the mouth quickly in a rhythmical manner without exerting any biting pressure. The dentist observes the action from directly above and will immediately realize that this is the

Fig. 3 • The supine rest position. The patient is in a reclining relaxed position. The head rest is placed below the occipitalis so that the head is thrown slightly back

Fig. 4 • Roentgenogram of the head in the supine rest position. A: Hyoid bone and infra- and suprahyoid muscles. B: Masseter muscle. C: Temporal muscle. D: External pterygoid muscle. E: Glenoid fossa. Note in this position the external pterygoid muscle must work directly against gravity and the stress of the muscles above and below the mandible

most advantageous position from which to analyze the hinge movement and centric relation of the mandible.

Before attempting the technic, it is a good plan to personally assume the position and experiment with the chop-chop motion. Centric relation is found to be natural and it is an effort, accompanied by quick fatigue, to hold the jaw in any other position. In this position it is at once apparent that the patient would be unlikely to register the pseudo-centric relation produced by a conditioned reflex of the masticating muscles.

TECHNICAL PHASE

The relation of the two arches must be consolidated and exactly transferred to a suitable instrument. The ideal method should be automatic so that no effort is necessary by either the patient or the dentist which might disturb the very transitory location that is being recorded.

After many experiments the use of zinc oxy-resinate impression cement was found to be most suitable. By blending the cement with talcum powder in very hot weather, a proper soft nonrunny viscosity can be obtained which quickly sets to a tough tenacious brittle mass that records dimensions with great dependability.

Check-bites are obtained with this material by applying it to both sides of a piece of .020 or .040 Fiberglas or on thin roughened wax sheets (Fig. 5A). The patient is placed in the supine relaxed position and instructed to just hold the teeth gently together when contact occurs. The mix should be about as thick as bricklayer's mortar and for this reason the cement is supplied in a fast set for winter use and a slow set for summer use. Properly mixed, the material sets in 30 seconds and the check-bite may be removed in two minutes. The cement does not stick to the teeth but holds tenaciously to the dry Fiberglas or rough wax. Centric relation is thus very quickly registered with a material which shows sharp detail for precise assembly of the casts (Fig. 5B). Conventional check-bites in wax of course may be made in this position but they are considered less exact, especially in severe malocclusions.

TECHNIC APPLIED TO DENTURES

In partial and immediate insertion cases where only the anterior teeth are left, as well as in full denture cases, the first step in recording the temporomandibular relationship is to establish the vertical dimension or denture space. Authorities frequently fail to emphasize that the anterior teeth seldom preserve either the true condylar centric relation or the optimum vertical dimension. Failure to observe this fact often causes an unsatisfactory result.

The rest position is our landmark and must first be established. The patient is seated erect in the chair without support

of the head (Fig. 6). Two dots are placed on the face, one on the nose and the other on the chin, at points which seem free from movement. These dots may be tattooed with fine pink ink for a permanent record or temporarily marked with pencil or ink. By pronouncing the word "Emma" or "M" the patient will place the mandible in a rest position. Relax is the key word. Relaxation is best obtained with the old dentures in place or with the mouth empty and the head tilted slightly forward. Strange baseplates, usually large and rough, are a distracting influence.

Measure the distance between the dots with a large pair of calipers, the points of which have been filed flat (Fig. 7, left). Have the patient stand and walk about, then measure the distance between the dots while the patient is in a standing position. When the measurement is the same five times, it is reasonably certain that the rest position has been obtained. It must be the measurement that is found constantly rather than any average of the measurements because the mandible constantly returns to the rest position.

Trim or raise the baseplates so that with the jaw firmly closed the caliper points register exactly on the dots. Then soften the wax occlusal surfaces by flaming and, while holding the calipers on the dots, have the patient close down hard enough to force the mandible 3 or 4 mm. closer than the rest position distance (Fig. 7, right). Chill the baseplates well and return to the mouth. Check several times for the freeway space which should exist at this time in the biterims. The patient should be conscious of the fact that the rims come together only when they are put together.

The occlusal height has now been established in the wax rims at the optimum distance of 3 to 4 mm. above the rest position. Now is the ideal time to set up the anterior teeth, or at least the upper anterior teeth. More people wear dentures for cosmetic reasons than for any other. Therefore in fitting the mouth esthetics as well as mechanics must be considered. The arrangement and occlusion of the posterior teeth are predicated on the position of the cuspids. By first fixing the position of the cuspids, annoying changes and dissatisfaction are prevented.

Next the two biterims should be consolidated in centric relation at the now established height. Place the patient in the supine relaxed position and rehearse

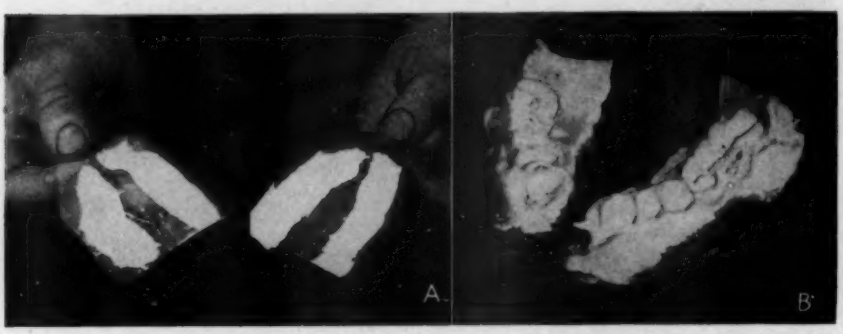

Fig. 5 • Taking the check-bite. A: Fiberglas sheet (left), thin roughened wax (right) with application of resinous cement on both sides ready for taking check-bite. B: The completed check-bite. Note the positive detail for assembling casts

Fig. 6 • The patient seated in the chair, ready to establish the rest position of the mandible. The body is erect with the head tilted slightly forward and no head support

the placing of the biterims lightly together without effort. Dry the biting surface of the wax rims and score them deeply with a knife. Use a small amount of denture adhesive on the tissue surface to insure close adaptation to the tissues. Have the patient hold the lower denture tightly in place with two gauze packs while the resinous cement is mixed. Place a layer of the cement, mixed as thick as mortar, on each side of the occlusal surface of the upper rim (Fig. 8A).

Place quickly in the mouth and push tightly against the palate to insure close adaptation and tell the patient to close gently to contact and hold steadily for 30 seconds. In this time, if properly mixed, the initial set has occurred and danger of movement is over. Remove both rims in two or three minutes. They are tightly sealed together at the location of centric occlusion (Fig. 8B).

CHECKING THE FINISHED DENTURE

Because it is impossible to fit the baseplates to the cast in the same manner that they fit the mouth and because of processing errors, dentures should be checked before delivery to the patient. This applies even more certainly to any attempt at rebasing or to impressions taken in the trial denture. Failure to do this is the cause of much unnecessary dissatisfaction. Processing errors or bites taken slightly in

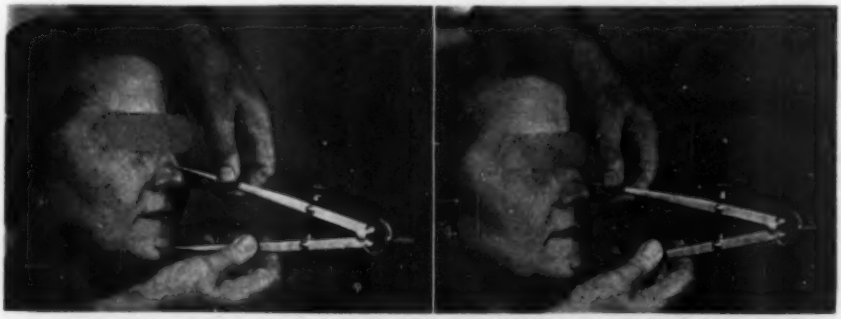

Fig. 7 • Obtaining rest position and freeway space. Left: The distance between the two dots is measured five times to insure the position of constant return. Biterims are changed to hold this position. Right: The surface of the biterims is softened by flaming and the patient bites until a freeway space of 3 to 4 mm. is established. This is the optimum occlusal height

protrusion cause one or both of the second molars to strike first. No one thing has been the cause of more discomfort, especially to the patient with poor adaptation. Conversely, there is no one thing the dentist can do that is more helpful to denture retention than establishing and maintaining good centric occlusion. Attempts to make these corrections in the mouth by carbon paper spot grinding usually end in cusp mutilation that is pathetic to observe and sometimes worsens the condition.

It is advisable also to check the dentures again after a few weeks of wear when some settling may have occurred. Denture patients should be advised to return periodically for checking and the reason why should be explained and emphasized. Aberrations are discovered by this checking that may not be seen in any other manner. This method is simple and avoids spot grinding at the chair except for eccentric interference.

Place the patient in a supine relaxed position and inspect the occlusion with the chop-chop movement in centric relation. Any gross error may be stoned off at this time. To prevent the resinous cement from sticking except where needed, freely lubricate the dentures except on the occlusal surfaces. Use a small sprinkle of denture adhesive powder to insure close adaptation and have the patient hold the lower denture firmly in place with gauze.

Place the thick mix of resinous cement sparingly on the posterior teeth of the upper denture (Fig. 9A), then insert the denture quickly in the mouth and press firmly to place. Instruct the patient to close the teeth gently to contact and in two minutes remove both dentures firmly locked at centric relation (Fig. 9B). Place wet cotton in the undercuts and mount the ensemble on an occluding frame with quick setting plaster. The whole operation should not require more than 20 minutes. Break away the resinous cement and examine the occlusion. The check often is surprisingly revealing. Grind the denture back to centric balance. Use hard thin carbon paper and avoid flattening the cusps. Grinding a sulcus for the cusp to move into provides more efficient occlusion. Without true axis registration the mechanical error increases with this method as the opening of the bite, because of aberrations, increases.

The perfectionist will record the axis but without such recording the grinding should be limited to 0.5 mm. at one registration of the centric relation. Despite the admitted error of using an arbitrary or casual axis in this correction, it is believed that the total error is small com-

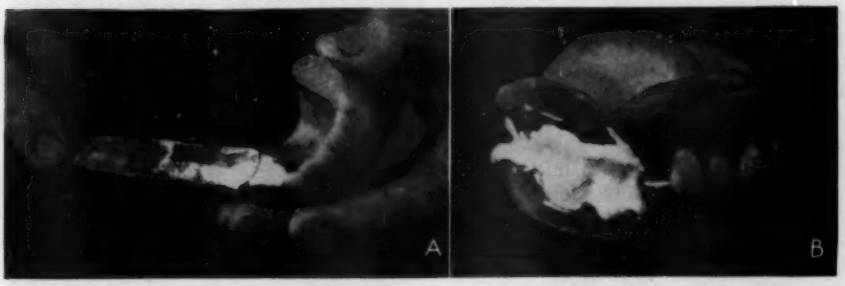

Fig. 8 • Fixing dentures in centric relation. A: A thick mix of resinous cement is placed on the biting surfaces. B: The rims are tightly sealed together at centric occlusion

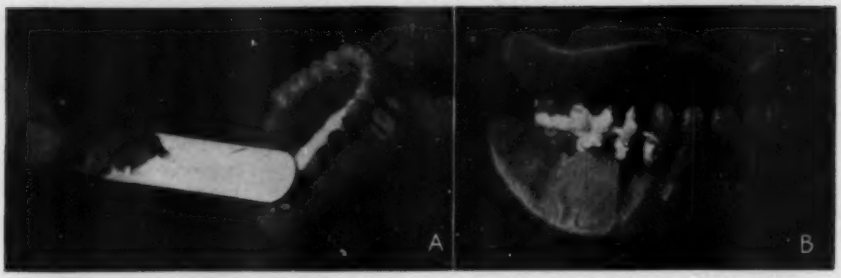

Fig. 9 • Rechecking occlusion. A: The dentures are lubricated except on occlusal surfaces and resinous cement is applied. B: The dentures are securely locked at centric relation

pared to the errors in dentures that are not checked after processing.

CORROBORATIVE DATA

After several years of considerable clinical success with this method, it was decided to confirm the question of the dependability of the theory and technic by a series of controlled tests.

The application of experimental inference is based largely on a speculation of probability from a series of random tests. If three registrations are made of a given position, it is reasonable to suppose that all of them will not be in the same error and if all of them result alike, it seems reasonable to assume that the registration is correct. If the per cent of error is great, it is probable that one registration will be different. Thus, it was decided to make the inference on the basis of three check tests for each registration on a series of random cases.

Fifteen full denture cases, and sixteen individuals with natural dentition, and a variety of occlusions, were carefully checked. Careful alginate impressions were made of the upper and lower natural teeth. A check-bite was made in the manner described and the casts were mounted on a Brown analyzer (Fig. 10). This instrument is a polished flat plate with two parallel triangular ridges. It is dependable for checking constancy of position because there are no moving parts and the ridges are machined accurately. Two additional check-bites were then made of each case and eight cases were checked by four unilateral bites that could be interchangeable.

The fifteen denture cases were mounted on tightly locked articulators, either a Hanau or McCollum. Each set of bite-rims was recorded at centric relation, mounted and checked twice and each

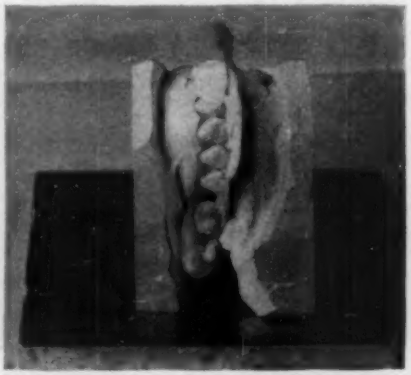

Fig. 10 • Brown analyzer with casts and Fiberglas check-bite

denture was remounted on an articulator after construction and again checked twice, making a total of six registrations for each case.

In the sixteen cases of natural dentition (Fig. 11) with a total of 64 registrations there appeared only one error. This error was in one unilateral registration and could have been caused by overcooperation. Instead of remaining relaxed, the patient probably overtensed the muscles on the side of the mouth that was being tested.

Although the Brown analyzer is ideal for proving the constancy of a given position, the flat plate locates the axis at infinity and the casts move in a straight upward line from the initial contact of cusps to the final intercuspation, whereas the actual movement is a curve predicated by the axis movement and the possible forward movement of the condyles. Two of the cases of natural dentition thus mounted had the appearance of malocclusion. New casts were made and the exact axis recorded with an adjustable face-bow firmly cemented to the mandible (Fig. 2). The casts then were mounted by use of the same face-bow and Fiberglas check-bites on an articulator capable of translating an exactly recorded axis (Fig. 12). When this was done the intercusping was perfect. The cusps of the second molars no longer merely touched as had been shown on the analyzer. From the clinical experience gained in this study, it appears that determining and recording at least the axis movement aid in analyzing the occlusion, especially where used for relief grinding in periodontal treatment.

Fig. 11 • Sixteen casts of natural dentition which were used in the study

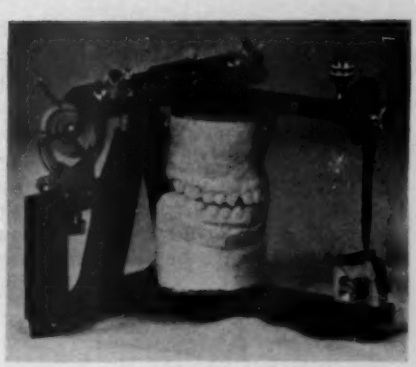

Fig. 12 • McCollum gnathoscope used in the study to translate the exact axis

Of the total of 90 registrations made on the 15 denture cases there appeared no deviation from the original mountings. Each check fit the articulator as originally mounted. This was a phenomenal record of constancy, but if ordinary care is taken to relax the patient the exactness of the technic will allow any dentist to record centric relation with the same assurance of constant results.

With no more equipment than is contained in any dental office, it is possible to make similar check tests that will prove the simplicity as well as reliability of this method.

SUMMARY

1. The ability to recognize and record the centric relation of the mandible is a basic requisite in dental science.

2. The rest position of the mandible,

established by the stato-tonic reflexes of cranial equilibrium, places the mandible in centric relation and provides a clew to the proper position of centric occlusion.

3. The idle relaxed mandible moves between centric relation and centric occlusion in a simple hinge movement.

4. The supine rest position is the logical position to record centric relation because gravity and the pull of the anti-gravity muscles make any eccentric position a physical effort.

5. A technic was devised to automatically record the position without effort by the patient or disturbance by the dentist.

6. A total of 154 registrations was made to check the constancy of the method.

1525 East Fifty-third Street

General anesthesia in pediatric dentistry

Henry T. Thomason, D.D.S., Cincinnati

Pediatric dentistry differs from adult dentistry in numerous ways. Some of the factors involved are: age, emotional stability, general behavior pattern, inability to reason, psychic disturbances resulting from fear or unpleasant previous dental experiences, and general health.

Each child seeking dental advice and care is an individual problem. From the pathological condition present in the oral cavity can be determined the extent of treatment indicated. From this point the method of approach will afford success only if the child has confidence in his dentist. Confidence can be achieved by freedom from pain during the procedure. This freedom from pain is perhaps one of the greatest factors in successful pediatric dentistry.

On October 16, 1846, William Morton administered ether anesthesia to a patient at the Massachusetts General Hospital, thus making one of the greatest contributions to surgical science by solving the problem of pain during any operative procedure.

The choice of anesthesia for children is a most important problem. The ease of administration and safety to the child are two outstanding considerations. Broadly stated there are two types of anesthesia for children which are usually used, local and general. Sedatives, particularly the barbiturates, are often used alone, or in combination with local and general anesthesia. Modern barbiturates, such as phenobarbital, Nembutal, Seconal Sodium and Tuinal, offer the dentist a choice of reaction time for a given minor procedure which obviously does not require anesthesia.

LOCAL ANESTHESIA

Local anesthesia, alone or supplemented with barbiturates, may be used for many children, depending on their age and their reaction to the entire dental problem. Most of you are aware of the limitations of this technic.

Read before the Section on Oral Surgery and the Section on Pedodontics and Oral Hygiene, ninetieth annual session of the American Dental Association, San Francisco, October 20, 1949.

From the Department of Dentistry, the Children's Hospital, College of Medicine, University of Cincinnati.

GENERAL ANESTHESIA

The indications for general anesthesia may not be agreed upon by all who practice pediatric dentistry. However, I believe there are specific indications for the use of general anesthesia.

Age • General anesthesia should be used for the very young child or infant, particularly for those children who have not yet developed the power of reasoning.

Patients with Physical Disabilities • Paralysis or mental and nervous disorders prohibit the use of any except general anesthesia.

Extensive Dental Procedures • Patients submitting to multiple dental extractions or restorations and patients with injuries to the teeth and supporting structures require general anesthesia.

Severe Dental Sepsis • From a surgical point of view, general anesthesia is safer than local anesthesia when treating severe dental sepsis.

Uncooperative Children • General anesthesia affords an excellent means of managing the frightened, extremely nervous, apprehensive, uncontrollable child.

EVALUATION OF GENERAL ANESTHESIA

The indications for the use of general anesthesia suggest many of its advantages. However, there are advantages for the dentist as well as for the patient. The dentist can give full attention to details of the procedure without haste, he is not obstructed in his work by a noncooperative patient, and he is able to accomplish much more than could be done at one appointment under local anesthesia.

There are also disadvantages of general anesthesia. These include the danger of administration, obstruction of the tracheobronchial passages, aspiration of foreign material, and postoperative nausea and vomiting. The recovery period may require observation and care.

General anesthesia is administered with greater safety to hospitalized patients than to ambulatory office patients, since one may better control the preoperative, operative and postoperative periods. Nevertheless, general anesthesia may be used successfully in office practice for less extensive procedures where such an agent is indicated. Proper evaluation of the individual problem and the usual precautionary measures should be undertaken before giving any general anesthetic agent.

TECHNICS OF ADMINISTRATION

Many agents have been used, alone or in combination, including chloroform, nitrous oxide with air or oxygen, ethyl chloride, ether, vinyl ether, cyclopropane, tribromoethanol and thiopental sodium, but, in my opinion, the greatest safety lies in the use of the combination of nitrous oxide-ether-oxygen. Administration may be facilitated by the use of barbiturates with or without morphine and scopolamine in the proper dosage.

In short dental procedures the semiopen method of administration is used. However, in more extensive cases the closed (carbon dioxide absorption technic) is the method of choice. The closed method of general anesthesia consists of induction with a face mask. When anesthesia reaches the second plane of the third stage, an endotracheal tube is passed through the nose into the pharynx and finally into the trachea. The position of the tube must be exact and tested by listening to or watching respiratory movements. This point cannot be overemphasized. Where there is nasal obstruction, oral intubation by direct vision is indicated. Whether or not the pharynx is packed depends upon the surgical procedure contemplated.

The advantages of closed nasal intubation are:

1. All anesthetic equipment is remote from the operative field.
2. There is no obstruction of the tracheobronchial passages and respiration is not hindered during the procedure.
3. There is little or no danger of pulmonic aspiration which complicates the open method.
4. There is uniform administration of the anesthetic agent.
5. There is little or no anoxia, depending on the amount of oxygen supplied.
6. Higher concentration of oxygen may be given and less of the general anesthetic agent is needed.
7. There is less loss of body heat and fluid than with the open method.
8. Many of these advantages predispose to a smoother postoperative recovery period.

The disadvantages of closed nasal intubation are:

1. Possible hemorrhage from trauma to the nasopharyngobronchial system from careless intubation.
2. Possible injury to the teeth from improper use of the laryngoscope.
3. Possible injury to the vocal cords from trauma or the use of an oversized endotracheal tube.

I believe that the advantages gained by using the closed nasal intubation method offset the disadvantages.

CONCLUSIONS

1. Many of the factors concerned with pediatric dentistry have been discussed.
2. The indications for general anesthesia in treating children have been discussed. These are: age, physical disabilities, extensive dental procedures, severe dental sepsis and uncooperative children.
3. The technics for using the semiopen and the closed methods of nitrous oxide-ether-oxygen have been discussed and the advantages and disadvantages of these methods have been outlined.

Attitude Toward Disease • Certain human societies and cultures have advanced beyond the "primitive" stage in their attitudes toward disease and toward the therapy of disease, and have attained the prescientific or very early scientific stage of cultural development, characterized by an interest and the attainment of some skill in the investigation of biologico-physical reality and in the recording and utilization of the knowledge thus attained. Ancient Greek society of the Fifth Century B.C., which laid the foundation for the modern world, had attained this stage only to lose it in the succeeding century, after which a similar stage of cultural development was not attained until the Renaissance, eighteen centuries later. The stimulating effect of the Hippocratic medical writings in all ages during which access to accurate editions of them have been available is evidence of the valuable insights attained by ancient Greek physicians, in spite of their limited knowledge of natural processes. *Maurice N. Walsh, "Concepts of Therapy," Proceedings of the Staff Meetings of the Mayo Clinic 25:542, September 13, 1950.*

Methods and costs of water fluoridation

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There is a steadily growing movement among communities in the United States to fluoridate their water supply for the partial prevention of dental caries. The water fluoridation process is so new that few communities are well informed regarding methods of procedure, types and maintenance of equipment and costs. Therefore the following article, dealing with experiences gained during the past five years by Wisconsin public dental health authorities, is both timely and informative. Other communities which have pioneered in the fluoridation of water supplies may have had other experiences. If so THE JOURNAL will appreciate receiving them.

The Editor

Several state health departments and state dental societies, the United States Public Health Service, and the American Dental Association have recommended the addition of fluorides to public water supplies as a public health measure for the partial control of dental caries. The state of Wisconsin has been active in fluoridation programs for the past five years and has pioneered in the use of several types of equipment for feeding fluorides as well as in the use of different chemicals to supply the fluoride ion to the water. These public health programs have been carried out in Wisconsin in communities with as few as 500 inhabitants. A description of the engineering problems experienced while planning and administering fluoridation projects under varying conditions in over 75 communities of various sizes may be of some importance to communities contemplating a similar program.

Whenever a community decides to add fluorides to its public water supply, it should first determine what chemical is the most practical and economical to use. There are several factors which enter into such a decision, among which are: the type of feeding equipment that can be used; the cost of the chemical itself; the number of installations required; the ease and safety of handling and the amount of maintenance required in adding the fluorides. Most of the publicity regarding water fluoridation projects has been given to those in which sodium fluoride has been used. Undoubtedly this is because the first large scale demonstrations of the addition of fluorides to public

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water supplies (Grand Rapids, Michigan, Newburgh, New York, and Sheboygan, Wisconsin) started out by using sodium fluoride.

At that time (1945) the use of a dry chemical feeder was thought to be the simplest and most practical method of adding sodium fluoride to the water supply. However, the experience in Wisconsin indicates that sodium fluoride will not be the chemical agent of choice for fluoridating most large public water supplies. Medium size and large cities in the future may use sodium silicofluoride, since fluoridation by this chemical costs about one-third as much as fluoridation by means of sodium fluoride. The engineering problems are exactly the same where dry feed methods are employed. Sodium fluoride will be used chiefly in small communities where the feeding of a solution of sodium fluoride of approximately 3.5 per cent will take care of their fluoridation problems.

Wisconsin has pioneered in the feeding of solutions of hydrofluosilicic acid, hydrofluoric acid and solium silicofluoride as well as sodium fluoride. In attempting to determine which chemical should be added to fluoridate a particular water supply several factors must be considered among which are: whether the water is from a deep well or from a surface supply; the gallonage pumped daily and the capacity of the pump or pumps. If the community uses a ground water supply, the number of wells operating must be observed and consideration also must be given as to whether they empty into the water system in different parts of the community. Other factors are: the number of installations needed to fluoridate all the water; the type of mechanical equipment which will work best under the local conditions; the space available for installation and storage of the chemical and whether there will be constant supervision of the fluoridation equipment.

Considering these factors the installation of water fluoridating equipment may seem complicated but in reality it is not. Medium size and large cities have expert engineering staffs that have had many years of experience in feeding into public water supplies various chemicals such as alum, lime, carbon and chlorine. No special equipment needs to be developed for water fluoridation as the same standard equipment used for feeding other chemicals may be used for adding the fluoride. Experience in Wisconsin indicates that the best chemical for fluoridation in medium and large cities is sodium silicofluoride. It is in the form of white powder and is a by-product from the manufacture of commercial phosphates. There is a sufficient amount of this chemical available to meet all fluoridation needs, and it is selling currently for approximately 4 cents per pound. The cost of water fluoridation of a large city with this chemical should not exceed 4 to 5 cents per capita annually whereas the cost of using sodium fluoride under the same circumstances would be 12 to 14 cents.

Either sodium silicofluoride or sodium fluoride are introduced into the water system by means of a dry feeder (Figs. 1 and 2) which costs from $700 up, depending on the type required. Storage of the fluoridating chemical may be somewhat of a problem even for a large city as it is necessary to purchase the material in carload lots to get the lowest price, and the chemical must be stored in a dry place. Maintenance men filling the hopper of the dry feeder should wear dust proof masks and rubber gloves when handling either sodium silicofluoride or sodium fluoride (Fig. 3).

Most large cities use surface water supplies, and it is generally possible to fluoridate all of the water with one installation. Communities having several wells that are pumped into the water main at different locations will need an installation for each well. However, should more installations be needed for

a large community the expense of the extra equipment is not an important factor as the per capita cost is small, and skilled personnel, experienced in the feeding of chemicals into a water system, is available. One Wisconsin city which has been using sodium fluoride has switched successfully to sodium silicofluoride, using the same equipment with slight changes in the feeding adjustments. With any type of standard equipment it is simple to maintain the exact parts per million of fluoride desired in the water. In Wisconsin most communities maintain a 1.2 ppm ratio and rarely is there a variance of over 0.1 of 1 ppm. A maximum of 1.5 ppm is set by the Wisconsin State Board of Health.

Although sodium silicofluoride and sodium fluoride may be substituted for

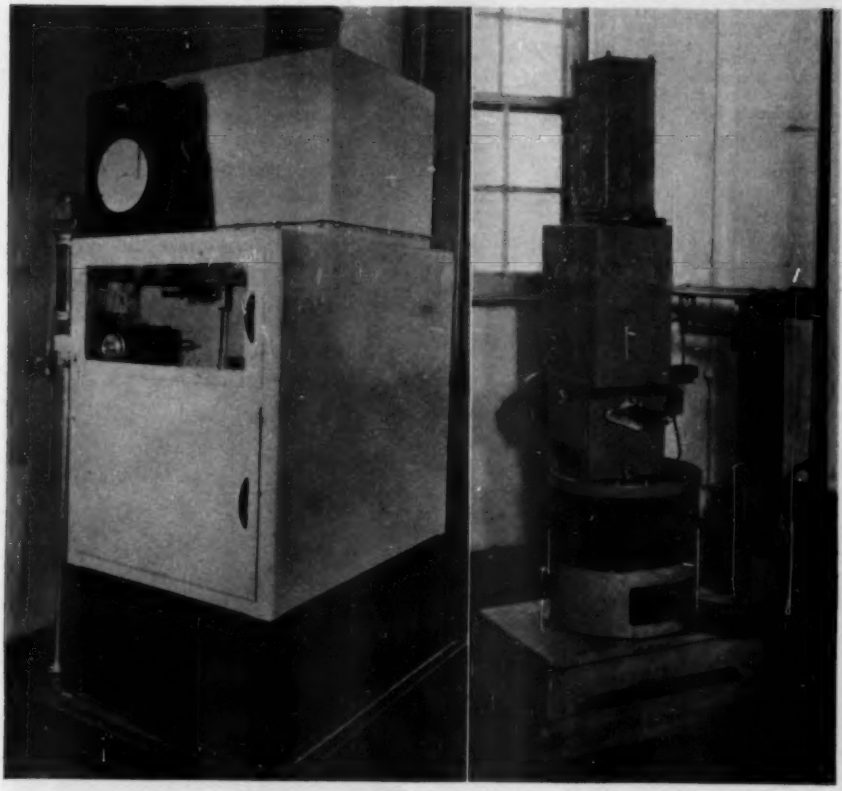

Fig. 1 • Left: Omega Gravimetric Dry Feeder (Omega Machine Co., Providence, R. I.) using sodium silicofluoride. Equipment and installation cost approximately $3,000. This type suitable for large cities. In use in Racine, Wisconsin. Right: Wallace and Tiernan Volumetric Dry Feeder (Wallace and Tiernan, Newark, N. J.) using sodium fluoride. The upper part of the feeder is the hopper containing the sodium fluoride. Suitable for small cities. Costs approximately $800. In use in Neenah, Wisconsin

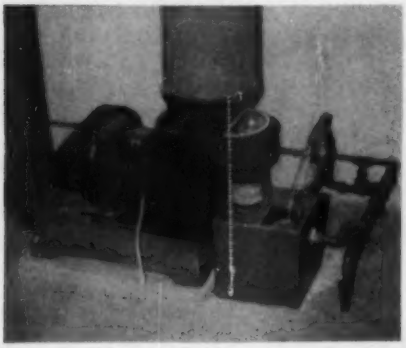

Fig. 2 • Omega Volumetric Dry Feeder using sodium silicofluoride. Sodium fluoride also can be used. Suitable for small cities. Costs approximately $800. In use in Menasha, Wisconsin

one another in dry chemical feeding, the substitution is not possible where a solution is going to be fed in a small community. Sodium fluoride is 4 per cent soluble whereas sodium silicofluoride is only 0.4 per cent soluble in water, therefore a sodium silicofluoride solution would be too bulky for practical purposes. In Wisconsin where solution feeders are installed, a 3.5 per cent sodium fluoride solution is used. Approximately 3 pounds of sodium fluoride to 10 gallons of water will make a 3.5 per cent solution. Using a sodium fluoride solution the cost of fluoridation is about $2.50 per million gallons of water. Approximately 19½ pounds of sodium fluoride (95 per cent) will fluoridate one million gallons of water. The current price of sodium fluoride is 11 cents per pound plus freight. Figures 4, 5 and 6 show the tank containing the sodium fluoride solution and the small diaphragm solution feeder pump which injects the fluoride solution into the water system. Liquid feeders suitable for this purpose sell for approximately $350 (Fig. 7). If the city water is very hard it may be desirable to install a water softener so that soft water can be used in making the solution of sodium fluoride, otherwise a precipitate of calcium fluoride will form and eventually clog the line or the chemical pump. A Zeolite water softener, found satisfactory in Wisconsin, costs about $75.

The use of a dry chemical feeder in smaller communities has been found to be impractical in Wisconsin in most instances because any dry chemical has a tendency to cake in the presence of moisture. This does not make a great deal of difference in a large city as engineers can install equipment to prevent the caking from interfering with the operation of the feeding mechanism. Such an arrangement is not practical in a small community where generally the water department does not have constant supervision in the pumping station. If the caked chemical, either sodium fluoride or sodium silicofluoride, jams the feeding equipment, either too much or too little concentration of the fluoride in the water supply will result.

Fig. 3 • Sodium fluoride being dumped into hopper located on the floor above the feeder

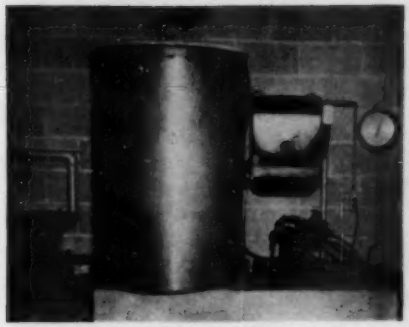

Fig. 4 • Wallace and Tiernan Chemical Solution Feeder (sodium fluoride) and large stainless steel solution tank. Suitable for small cities, towns and villages. Costs approximately $600. In use in Oregon, Wisconsin

The problem of caking and subsequent jamming is eliminated when solutions of sodium fluoride are fed, as there is no danger of the liquid feeding mechanism becoming deranged. The mixing and maintenance of a proper strength solution can be taught to any intelligent employee in the water department of a small community. Some small communities use two 30 gallon crocks as containers for the sodium fluoride solution while other communities use larger stainless steel tanks. A short chemical hose connects the tank or crock to the solution feeder and to the water main.

Small communities usually have no provision for chlorination of their water in case of an emergency. The solution feeder used for fluoridation can be used, in an emergency, to feed hypochlorite solution into the mains for the disinfection of the water supply.

Hydrofluosilicic acid (30 per cent) can be used in the small community as the fluoridating agent as successfully as a sodium fluoride solution. The hydrofluosilicic acid has the advantage of being less bulky than the sodium fluoride solution and does not require mixing. A given amount of it will last a longer period of time. A 50 gallon barrel of hydrofluosilicic acid will fluoridate approximately 15,000,000 gallons of water whereas an equal amount of sodium floride solution (3.5 per cent) will fluoridate less than a million gallons. The same chemical feeder pump used for feeding solutions of sodium fluoride (Fig. 7 left) can be used for feeding the hydrofluosilicic acid if a special head is installed on the pump. Where plans are made to feed hydrofluosilicic acid the manufacturer will furnish the special head on the chemical feeder at no extra cost.[1] When hydrofluosilicic acid is used

1. Wallace and Tiernan Company, Newark, N. J.

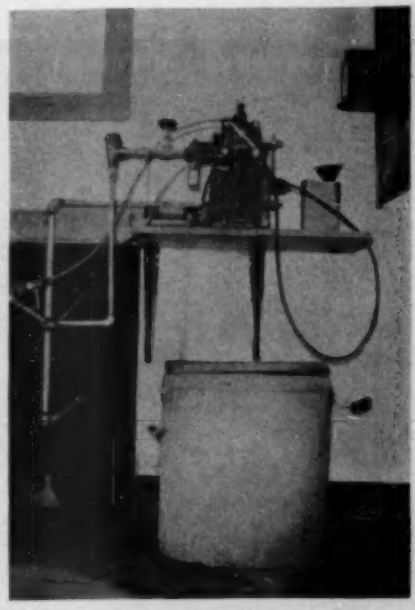

Fig. 5 • Wallace and Tiernan Chemical Feeder with special acid-resisting head feeding hydrofluosilicic acid. The 30 gallon crock contains the acid. A solution of sodium fluoride can be fed using this same installation. Suitable for small cities and towns. Costs approximately $450. In use in Rhinelander, Wisconsin

a special plastic feeder hose and fittings must be employed. The acid can be drawn directly from the barrel and discharged into the water main. Although hydrofluosilicic acid is mildly corrosive to metal, necessitating a special head on the chemical pump, it is not dangerous to the individual if it is handled carefully.

Hydrofluosilicic acid cannot be used by all small communities. If the pump in a community has a capacity of less than 250 gallons per minute, hydrofluosilicic acid cannot be controlled accurately with the present size chemical feeders available. To insure accurate feeding the Wisconsin State Board of Health has set 300 gallons per minute as a minimum capacity pumpage where hydrofluosilicic acid is used. Although hydrofluosilicic acid can be diluted so as to make it usable where pumps have a smaller capacity, it is more practical to use a solution of sodium fluoride. The cost of fluoridating a communal water supply with hydrofluosilicic acid is slightly less than with sodium fluoride; approximately $2.25 per million gallons of water.

One city in Wisconsin is using hydrofluoric acid as the fluoridating agent because of special conditions prevalent in that community. However, because of the danger to personnel in handling hydrofluoric acid and the complicated equipment needed, it should be used only in special instances and then only on recommendation by the engineer.

In general any community that cannot supply constant supervision of its

Fig. 6 • Proportioneers Chemical Feeder (Proportioneers, Inc., Providence, R. I.) for sodium fluoride solution, with saturator type tank and Zeolite water softener at right. This is a double installation to take care of two separate wells. Suitable for small cities and towns. Costs approximately $800 per installation. In use in Fort Atkinson, Wisconsin

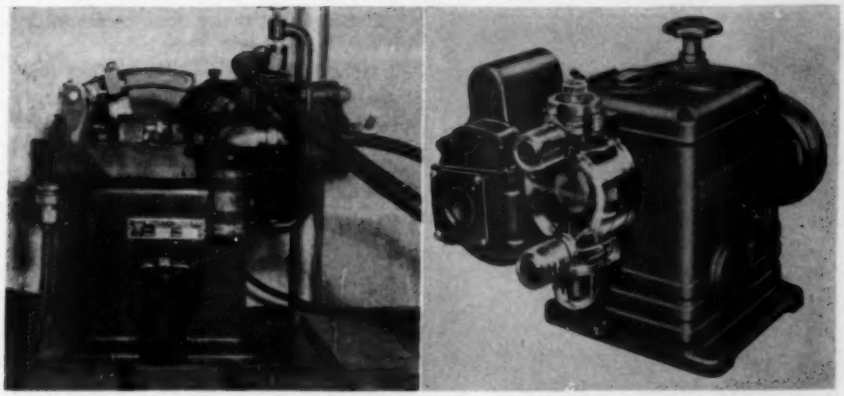

Fig. 7 • Left: Wallace and Tiernan Chemical Feeder Pump, for feeding solution of sodium fluoride or hydrofluosilicic acid. Costs approximately $350. Right: Proportioneers Chemical Feeder Pump for feeding a solution of sodium fluoride. Costs approximately $350

fluoridation equipment would be better off using liquid feed equipment; one that feeds either sodium fluoride solution or hydrofluosilicic acid. This type of equipment is not only more dependable under these circumstances but it is less expensive, and in the small community expense is always an important factor. There are several Wisconsin communities adding sodium fluoride and hydrofluosilicic acid where the equipment costs less than $500 per installation.

The health authority of most states will require that plans and specifications covering the fluoridation installation be submitted to them for approval. This means that if a qualified engineer is not in the employ of the city, the services of a registered engineer must be obtained to furnish the state health authority with these data. In Wisconsin a copy of the ordinance passed by the community authorizing the addition of fluorides is required by the health authority of the state. In this state the expense of water fluoridation can be borne either by the health department or the water department of the community.

When fluorides are being added to public water supplies in Wisconsin the State Board of Health requires a daily test of the fluoride content of the water by the local water department. The Board also requires that for the first six weeks during which fluoridation is in progress, a weekly sample be sent to the State Laboratory of Hygiene for analysis as to the fluoride content. Following this a monthly water sample must be forwarded to the State Board of Health for fluoride analysis. A daily test must also be made locally. The local fluoride determinations do not have to be made by a chemist. The Taylor Water Comparator for water analysis is generally used by the local water department for fluoride determination. It is so designed that the average waterworks operator in a small community can make the determinations with reasonable accuracy. In using the Taylor Comparator a measured sample of water and testing solution is thoroughly mixed, allowed to stand for exactly one hour and matched against the color of permanently sealed standards that are a part of the instrument. This is a colori-

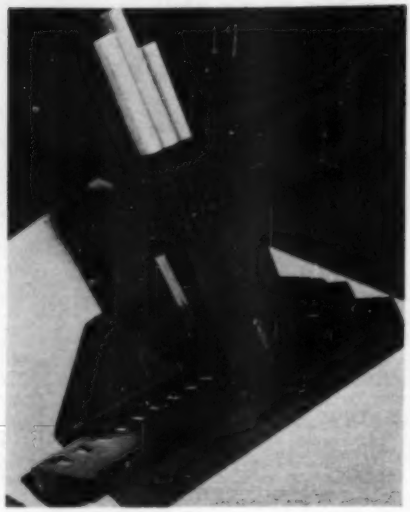

Fig. 8. • Taylor Water Comparator (W. A. Taylor and Co., Baltimore, Md.) used for testing fluoride content of water. Costs approximately $30

metric test and anyone with average intelligence can be taught to make and read this test accurately in a short time. The Taylor Water Comparator (Fig. 8) costs approximately $30.

The state health authority in most instances will determine the maximum fluoride content permitted. In Wisconsin the maximum is 1.5 ppm, and approximately 1.2 ppm is recommended.

Areas of the country where there is increased water consumption during prolonged hot weather may find it advisable to maintain a lower fluoride concentration in their supply during that period.

The fact that many small communities of less than 1,000 population are accurately and economically adding fluorides to their public water supply should dispel the fear that this public health program can only be had in large communities that employ expert engineering personnel.

CONCLUSIONS

1. There are several types of standard mechanical equipment suitable for fluoridation. There are also several chemical compounds which can be used for water fluoridation.

2. The cost of water fluoridation can be anywhere from 4 to 5 cents per capita annually where sodium silicofluoride is the fluoridating agent to 10 to 14 cents per capita where sodium fluoride is used.

3. Equipment for adding fluorides to public water supplies varies in cost from $500 in small communities to several thousand dollars in large cities.

4. There are several companies specializing in equipment for the feeding of chemicals into public water supplies that can assist local communities in selecting proper fluoridation equipment.

5. Small communities where the fluoridation equipment is not under constant supervision in general should use the liquid feed rather than the dry feed method.

6. Any community with a municipal water supply can successfully carry out a properly planned and carefully supervised fluoridation program.

Cleft palate: dentistry's opportunity

Herbert K. Cooper, D.D.S., D.Sc., Lancaster, Pa.

Cleft lip and cleft palate can be discussed from a medical, surgical, dental, speech or psychological viewpoint and much has been written on these various aspects. But since, in the past, the problem has always been considered separately in each of these different professional fields, and since each department has become more proficient in itself, there has evolved some confusion of thinking with regard to these oral deformities, and no one has known who should assume responsibility of treatment.

This paper presents a panorama of services with special emphasis on the dental, which can help to make the treatment of the cleft palate patient more successful. It is the writer's conviction that much of the problem has been and always will be the dentist's responsibility for it is in this field that the profession reaches its ultimate in usefulness. Therefore, in this account, only brief notice will be taken of other sciences, and the emphasis will be placed on the dental implications.

At first sight it might appear desirable to incorporate here all the philosophy and much of the technic of current cleft palate treatment. However, it is more important to describe the treatment philosophy fully than to present details of technic. This conclusion is justified by the many inquiries from dentists regarding the best method of making a speech appliance, obturator, or velum-obturator, whichever term their teaching suggests. There is no secret regarding the construction of cleft palate appliances as the procedure is taught in many dental schools. But the very fact that technic alone is requested demonstrates some misunderstanding of the subject. The solution of cleft palate treatment does not rest in the appliance alone; it is not that simple, nor is it a one-man job. In fact some cases, when surgery has been successful, do not need speech appliances.

It is the writer's privilege to be the director of the Lancaster Cleft Palate Clinic, which has examined or treated some 1,500 cases. The experiences gained in this clinic are used as the basis of this article. This organization was started in 1938, and in 1947 was incorporated as a "non-profit" health institution. It is incorporated under the laws of the Commonwealth of Pennsylvania for the purpose of "establishing, equipping, maintaining and operating an institution or clinic for the treatment of all defective

Read before the Section on Oral Surgery, ninetieth annual session of the American Dental Association, San Francisco, October 19, 1949.

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formations of the mouth, teeth and palate; for the establishing and operating of a school for the retraining of those with speech defects associated with or without oral defects and to conduct research in and distribute information relative to cleft palate problems."

The complete program includes the services of the surgeon, the pediatrician, the pedodontist, the oral surgeon, the orthodontist, the prosthodontist, the speech therapist, the psychologist and, if necessary, others such as the otologist and the radiologist. The training and experience of these specialists is called into use so that the background of their combined thinking is concentrated on the complete treatment of the entire individual. In other words, when a patient comes to this clinic with a cleft palate, the staff does not think of treating just the hole in the mouth, but rather of treating a person who, among other characteristics, was born with a hole in his mouth. There is a world of difference.

It has taken many years for our leaders in public health to realize to some small extent that persons who have deformities of this kind are really crippled. Yet the International Society for the Welfare of Cripples defines a cripple as "one whose activities may become so far restricted by loss, defect, or deformity of bones or muscles as to reduce his or her normal capacity for education and self-support." It is singular that it has taken so long to realize that these cases fit the description of a crippled child to the letter, but until recently, the facially or dentally handicapped were never included in any of the programs for crippled children.

Man has always been concerned with his health problems and is searching constantly for ways and means to solve them, but he must be careful lest, in correcting one wrong, he creates another. When, in 1840, the first dental school was established, little did the founders realize the effect it might have in future public health thinking, for at that time the training of the dentist was separated from that of the physician. From that time on the treatment of the teeth, mouth and jaws was considered the responsibility of the dental profession and the treatment of the rest of the body the responsibility of the medical profession. It is certain that the professions of medicine and dentistry can never actually be separated, but the physician and dentist did separate in their thinking many years ago, largely because of their training. The results can be seen when we consider the programs for crippled children. There are sufficient funds to treat a polio patient with crippled arms or legs, but for the care of the same patient with badly decayed, broken down, irregular teeth or deformed jaws, a separate fund must be found before dental treatment can be undertaken. At the present time, public health funds are available for most medical needs, while dental needs are very often ignored; yet cleft palate and cleft lip are the most frequent congenital deformities.

INCIDENCE

The incidence of cleft lip and cleft palate is striking compared with the incidence of other crippling conditions. The frequency of occurrence of cerebral palsy, for example, has been given by the National Society for Crippled Children and Adults as 7 in 100,000 babies. Of these, two die, and one is an idiot, it is said. This leaves a case load of four out of 100,000. These figures may be compared with the incidence of cleft lip and cleft palate. The reports of early writers indicated that the ratio of cleft palate cases to live births ranged from one to 1,000 live births to one to 2,200 live births. More recently, in various parts of the United States and abroad, the establishment of cleft palate as a reportable condition to Bureaus of Vital Statistics has made it possible to make a more careful survey of its frequency. A study by Lin-

wood Grace[1] revealed that in Pennsylvania one in 800 live births was reported as having cleft palate, cleft lip or both. Gretchen Muller Phair[2] has reported that the incidence of cleft palate in Wisconsin was one in 770 live births. Dr. Poul Fogh-Anderson of Copenhagen, Denmark,[3] in 1942 reported that the incidence was one in 638 live births. From these statistics it is reasonably safe to estimate that there is at least one cleft palate case in 700 live births. These findings show that compared with all other defective formations, the cleft lip and cleft palate constitute the most frequently found congenital deformity existing today. Think of it, the most frequently found condition has been getting the least amount of attention. What a paradox! When one realizes that much of the treatment lies in the dental field, one begins to see the great opportunity in dental health service.

HISTORY

Many excellent contributions on this subject by dentists are found in the earlier literature. One of the most masterful of them all is contained in the book *A Treatise on Oral Deformities as a Branch of Mechanical Surgery* by Norman W. Kingsley.[4] In it may be found a description of practically everything necessary for the handling of the cleft palate case from the dental standpoint. Dr. Kingsley saw the problem clearly, did extensive research and left to posterity an excellent textbook on the subject.

Many speech correctionists have declared that his drawings and study of tongue placement and the other factors used in the production of speech are just as accurate as are any in literature today. Among many other men in dentistry who have contributed to the literature on the care of cleft palate cases are Calvin S. Case, Rodrigues Ottolengui, Truman S. Brophy and more recently, John J. Fitzgibbon of Holyoke, Massachusetts. This by no means covers all the literature, but these men were the dental leaders in the field of cleft palate in their day.

SURGERY

The author has talked to very many excellent surgeons whose motives are sincere and unchallengeable and has found that their opinions vary greatly as to when the cleft palate operation should be performed. They all agree that the day is past when the baby should be rushed from the delivery room to the operating room to have the operation performed.

One of the most important considerations in our entire program is proper lip surgery. All cleft lip cases require the finest surgery possible, and if this is not provided in early infancy, the poor results will carry into the patient's life those hurtful psychological traumas which are so frequent.

In the case of surgery of the palate, an entirely different situation exists, if the total person is to be considered. Truman W. Brophy of Chicago came into prominence as one of the men doing modern palate surgery. He has been widely quoted and has done much to stimulate thinking in the direction of bringing help to these crippled children. However, his operation consisted mainly of forcing bones together in attempting closure of the cleft.[5] This difficult and delicate operation was successful from a surgical standpoint, but from the standpoint of the patient's dental future, including the development of the face and jaws, it was often less successful. Many times this type of operation produced facial deformities

1. Grace, Linwood G., Jr., Frequency of occurrence of cleft palates and harelips. J. D. Res. 22:495 (Dec.) 1943.

2. Phair, Gretchen Muller, Wisconsin cleft palate program. J. Speech Disorders 12:410 (Dec.) 1947.

3. Fogh-Anderson, Poul, Inheritance of Harelip and Cleft Palate. Copenhagen: Arnold Busk, 1942, pp. 26-38.

4. Kingsley, Norman W., A Treatise on Oral Deformities. New York: D. Appleton Company, 1880.

5. Dorrance, George M., The Operative Story of Cleft Palate. Philadelphia: W. B. Saunders Company, 1930, p. 405.

Fig. 1 • Typical facial deformity caused by a too radical surgical approach

and almost insurmountable orthodontic problems, because at the time of operation the total person was not considered and the dental aspect of the case was overlooked.

Until very recently, when a baby was born with a cleft palate, the obstetrician or physician immediately suggested surgery to correct the deformity. Everyone concerned was led to believe that surgery was all that would be necessary for that individual. Surgery was rarely considered as only a part of the treatment. Today those responsible for the care of a cleft palate patient must determine when an operation should be performed, how intensive the operation should be and then venture a prognosis.

The reason emphasis is placed on the necessity of properly considering palatal surgery as the first step in treatment is that once surgery has been done and fails, the damage is permanent. It is not enough to state that surgery should be attempted first, and a dentist called on later to construct an appliance if a failure results. That is not fair to either the dentist or the patient, for these cases are most difficult for the dentist to treat.

Aside from opinions derived from clinical observation, these statements are based on the work done by Brodie[6] of the University of Illinois, in his cephalometric studies on the growth of babies' faces and jaws and by Graber[7] of Northwestern University. These studies have revealed that when too much palatal surgery or too radical palatal surgery is attempted at an age when the palatal structures are developing most rapidly, the growth centers are inhibited and a very definite and typical facial deformity results (Fig. 1). These cases become the most difficult to treat. Such conditions could be avoided if a better understanding existed between the surgeon, dentist and others concerned with the handling of the case before treatment was attempted.

DENTISTRY AND SPEECH

As stated by Ottolengui[8] in 1913,

> It may be well to emphasize the fact that the mere insertion of an artificial palate can-

6. Brodie, Allan G., The growth of human head from third month to eighth year, Ph.D. thesis, University of Illinois, Chicago, 1940.

7. Graber, T. M., Craniofacial morphology in cleft palate and cleft lip deformities. Surg., Gynec. & Obst. 88:359 (March) 1949.

8. Turner, Charles R., editor, The American Text-book of Prosthetic Dentistry, Philadelphia: Lea & Febiger, 1913. "Palatal mechanism" by Rodrigues Ottolengui, p. 786.

not be expected to enable the patient to speak correctly, any more than the possession of a piano or violin would make the owner an accomplished musician. The artificial palate, properly constructed, supplies the patient with the means of perfecting his speech, but perfection itself must come through practice. Education by a teacher who thoroughly comprehends the needs of a cleft palate patient will greatly shorten the time required for improvement, as well as insure a better final result. But the cooperation of the patient is a requisite which is, strangely enough, not always to be counted upon. And it is those persons who have no ambition to help themselves, who claim that artificial palates have done nothing for them. . . .

. . . With normal organs, one produces articulate sounds by utilizing the normal actions of his throat muscles and the tongue and lips. With abnormal organs, as with cleft palate and harelip, the individual in the effort to produce the sounds which he hears from others, compels his tongue, lips and throat muscles to adopt habits which are totally dissimilar to normal movements. When, therefore, the artificial palate is inserted, with which perfect speech can be obtained only by normal movements, it is evident that the incorrect habits must first be overcome; and, secondly, the correct action of the organs must be acquired. Consequently, those dentists who report that instruments of their devising correct the patients' defective speech instantly, simply report what is not and cannot be true if the case be of congenital origin.

Since the acquirement of wrong modes of speech must prove so deterring to the patient who essays to improve his speech by resorting to an artificial palate, it is a reasonable corollary that the earlier the instrument is made the less will the patient have to overcome. It is, therefore, both wise and feasible to insert appliances even before the appearance of the permanent teeth. The cooperation of the patient, however, being of such importance, especially where lessons in articulation are to be given, which is always desirable, it is scarcely wise to undertake a case until the little patient is old enough to appreciate the conditions and their remedy. Therefore, except in rare cases, where the child is unusually well-developed and mentally bright, it is best to wait until the fifth or sixth year.

This long quotation shows that some of the earlier writers viewed this subject in the same light as we do today, and it also reveals the importance of the dental and speech implication.

Speech and its dental relations should be better understood by the dentist. Teeth primarily are organs of mastication and the process of mastication is a part of the digestive process. The other functions of the teeth are secondary. The teeth contribute to esthetics, and with the aid of surrounding structures, they have to do with the production of speech. Dentists have succeeded remarkably well in maintaining the health of the teeth for esthetic and masticatory purposes, but we seem to have been entirely oblivious of the speech implication. The eye is designed for seeing and the ear for hearing but no special organ is designed for speech. Many structures, designed primarily for other purposes, are called upon to aid in the production of speech. As an example, the teeth, jaws, tongue and lips play an important part in the process of mastication and digestion. These same structures plus the lungs, larynx and palate are used in the production of sound. Yet there has been very little coordination in training and in the recognition of this fact in the treatment of the disorders associated with each function. In the future, as speech centers are established, it is to be hoped that dentistry will be included in the program.

PSYCHOLOGY

In the Lancaster Clinic, after a thorough medical and dental examination and speech evaluation have been made, a battery of psychological tests were given which are extremely helpful in outlining treatment. The value of this approach is shown in the case reports.

Many of the Clinic patients were considered of low intelligence when they were first examined but the tests disclosed that some of them were superior to many other people of equal age. Many patients acted like morons because of their handicap. In fact several with the highest I.Q.'s acted particularly moronic because they were aware of the difficult situation in which they found themselves.

CLEFT PALATE AND SOCIETY

As remedial technics improve and understanding of the problem increases, it must follow that more people handicapped by cleft palates will be made acceptable to society. As parents they may introduce more cleft palate patients into the world. This does not imply that heredity is the sole factor in cleft palate deformities but it is an important one.

STATE AID

In the past, lack of funds has handicapped the treatment of many cleft palate cases. Recently, in Pennsylvania the State Bureau of Rehabilitation has assumed some of this financial burden. This Bureau has been very active and understanding and much good has been accomplished with its aid. At the present time through its program, one young man is in law school, another young lady is in dental school and still another is in college studying to be a speech correctionist.

Previously, funds were allotted for surgical treatment of certain types of cripples, but none were available for dental or speech needs. Recently, in the Commonwealth of Pennsylvania, the Assembly passed a bill providing for $160,000 for the next biennium to handle these cases in the manner outlined in this paper. In fact, the Secretary of Health has set as his goal the establishment of other clinics in the Commonwealth patterned after the one in Lancaster. Pennsylvania has become one of the first states in the United States to establish a comprehensive program for the complete management of cleft palate cases. Several other states are following the same policy.

PUBLIC EDUCATION

The citizens of this country should be as well informed on the subject of cleft palate as they are on poliomyelitis, cerebral palsy and rheumatic fever. Rotary Clubs, Kiwanis Clubs and other civic institutions, parent-teacher associations, in fact all community and social agencies, are very familiar with the problem of the handicapped person and are backing movements for their rehabilitation to the utmost. Why not bring to their attention the plight and need of the orally handicapped? This offers a great opportunity to the American Dental Association in furthering public relations.

CASE REPORTS

The results of experience in the Lancaster Cleft Palate Clinic can best be summarized by presenting two typical case reports.

Case 1 • (Figs. 2 to 5.) A young man of 17 years was brought to the clinic in August, 1942. He had a Type IV cleft palate, which is a complete cleft of the palate and a bilateral cleft of the lip. The patient knew of no pertinent hereditary background. During his infancy, surgery was performed to correct the deformity of the lip. The surgical work was accomplished in a series of eight operations. The premaxilla was removed in this period, and this loss resulted in an extremely flat lip as shown in illustration. His speech was poor. These factors had warped his personality, and developed in him a feeling of inferiority. He shunned all social contacts. He had left high school and was driving a truck. His family was extremely upset. He was given a medical, dental, speech and psychological examination by members of the staff of the Lancaster Clinic.

The physical examination revealed a well-nourished, well-developed male with cleft palate and cleft lip.

The speech examination showed his speech to be very poor. He experienced difficulty in making all sounds, with the plosives because of the lips, and with other sounds because of the cleft palate.

Fig. 2 • Profile before mouth reconstruction (Case 1)

The audiometric examination revealed his hearing to be normal in both ears. During routine psychological tests, the patient's potentiality for superior mental performance was discovered. On the Binet Scale he obtained an I.Q. of 124 passing tests through all three superior adult levels. The Rorschach Personality Diagnosis revealed an emotionally withdrawn, slightly antisocial outlook. He had a basically healthy, even though disturbed, personality pattern. A Wechsler-Bellevue Adult Intelligence Scale was used at a later date, and a higher I.Q. was obtained.

Then dental examination showed that five teeth remained in the upper arch and a full complement of teeth in the lower arch. Because of poor mouth hygiene, the oral and gingival tisues were highly inflamed.

His occlusion was impossible to classify. As the maxilla was very poorly developed, and the mandible normal, the typical deformity seen in many such cases was present.

After the staff had examined this patient, a conference was held, and all agreed that the prognosis was good and treatment was planned.

The treatment dealt with all phases of the case. It was decided to defer any lip surgery until the mouth was placed in a good hygienic condition. All necessary operative work was done in the lower arch. Thimble crowns were placed on all the remaining upper teeth so that an appliance could be constructed, covering these teeth, in order to build out the lip and cheeks to correct his severe deformity. This was also necessary to help the surgeon by forming a support to which he could form a better lip. A restoration of facial balance was obtained by constructing an appliance which was clasped to the remaining teeth. This appliance was so constructed as to overextend the upper lip, which later would aid the plastic surgeon in obtaining a more esthetic appearance. The posterior part of the appliance extended to Passavant's cushion to replace the missing soft

Fig. 3 • Thimble crowns placed on five upper teeth

palate. This enabled him to control his nasality in speaking.

While the dental work was being done, he received speech instruction. The speech lessons continued periodically for several years.

Members of the psychological department persuaded the boy to finish high school. He was then admitted to Franklin and Marshall college in Lancaster, Pennsylvania. The first two years there were quite difficult for him because of his social maladjustment, which he gradually overcame.

After the appliance had restored his lip to proper contour, more plastic surgery was performed. The result is shown in the illustration (Fig. 5) and demonstrates what can be accomplished through the cooperation of the dentist and surgeon.

As a result, this boy joined a college fraternity and graduated on the Dean's list. He is now attending law school in a large university. This case typifies what is meant by the "complete rehabilitation of a whole person."

Case 2 • (Fig. 6.) A girl, 10 years old, was brought to the Clinic June 28, 1941. She had a Type II cleft palate, postoperative, a cleft of the soft and hard palate. No hereditary history could be obtained.

Her palate had been repaired when she was 20 months old. The surgical closure was excellent. The palate seemed short, her speech was almost unintelligible. Her school work was poor and she experienced much difficulty at home. Her behavior was so obstreperous and she was so difficult to control that not much was accomplished until she was 13 years old.

A physical examination revealed a normal child with a repaired cleft palate.

Her speech was very poor but her hearing was normal.

In the Wechsler-Bellevue test this patient had a verbal I.Q. of 100 and performance I.Q. of 101, with a total I.Q. of 101, which indicated average mental ability. Her best performance on the verbal level was in arithmetic and her poorest performance had to do with digit symbols. She was excellent in picture comprehension and picture arrangement. She also had a good memory.

The Rorschach Personality Diagnosis indicated that this girl had a good healthy basic personality structure; she employed

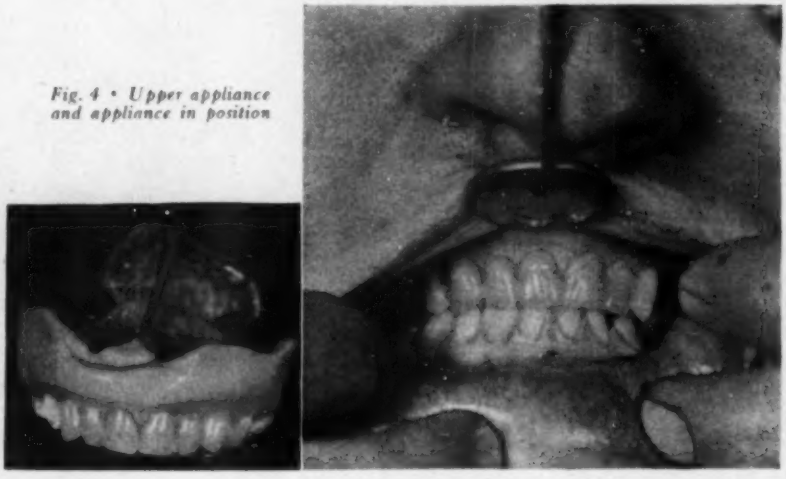


Fig. 4 • Upper appliance and appliance in position

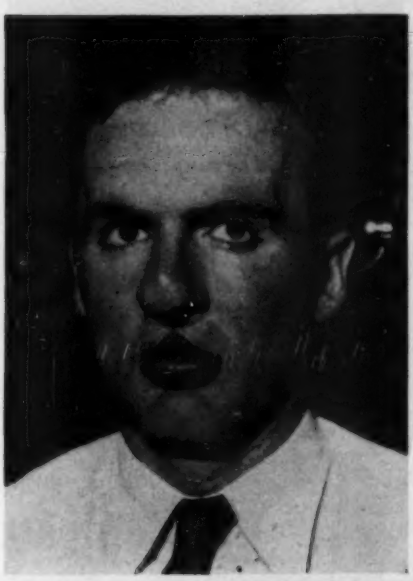
her intelligence, and was able to organize and take events in her stride. She was well disciplined and had a nice spontaneous reaction to emotional stimulus. She was able to see things as other people see them and was able to get along fairly well in social groups. There seemed to be little indication of fine feelings of affection or warmth in her personality; however this defect was not particularly observable in her general behavior.

This girl was ambitious, but not too ambitious to exceed her average ability.

In the dental examination, roentgenography revealed some caries and a normal occlusion. She had a full complement of teeth. Her facial balance was good.

Members of the staff agreed that the prognosis in this case was good and treatment was planned.

All cavities were filled and good oral hygiene was established. No speech appliance was considered necessary at first. Speech training and psychological guidance were started. Speech retraining was first attempted to determine if speech could be improved without an appliance,



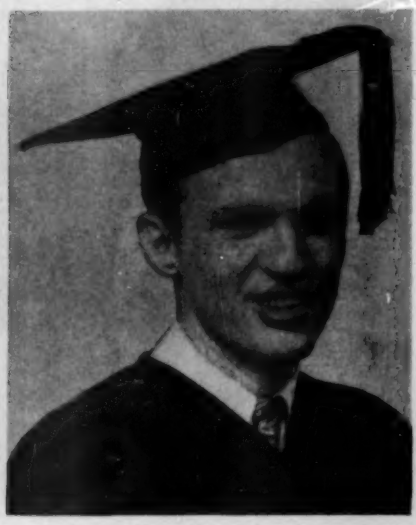


Fig. 5 • (Case 1) Left: Appliance in position before lip surgery. Below, left: Appliance in position. Below, right: Patient at time of graduation from college

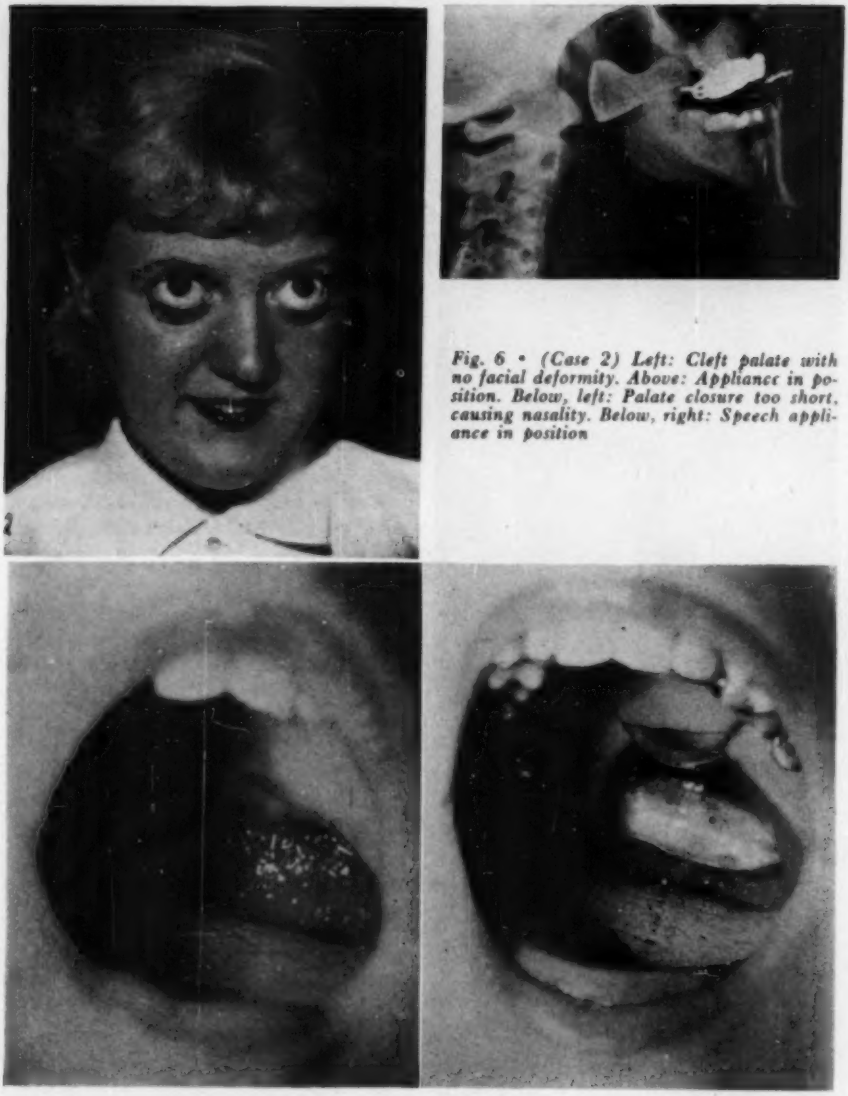


Fig. 6 • (Case 2) Left: Cleft palate with no facial deformity. Above: Appliance in position. Below, left: Palate closure too short, causing nasality. Below, right: Speech appliance in position

and her speech did improve under this treatment although much nasality persisted. A speech appliance was then constructed to help lengthen the velum. After this was placed, she acquired perfect speech. Her school work and home life improved.

As a result, the girl finished high school. She is now enrolled in college, where she plans to study speech correc-

tion. Again, the result is complete rehabilitation.

CONCLUSIONS

1. Cleft palate is one of the most frequently found congenital deformities.
2. All cleft palate cases should be reported.
3. Surgery is only part of the treatment for cleft palate.
4. Before radical surgery on the palate, the dentist and speech therapist should be called in conference.
5. The services of all of the dental specialties are required in most cleft palate cases.
6. The mere construction of a speech appliance with no other consideration is as bad as poorly considered surgery.
7. What has been accomplished for these two patients has been accomplished for many more at the Lancaster Cleft Palate Clinic and can be accomplished for countless others elsewhere through the cooperative efforts of the surgeon, dentist, psychiatrist and speech specialist.

26 North Lime Street

Polyostotic fibrous dysplasia of bone

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The purpose of this paper is to call attention to the occurrence of a general skeletal disease, polyostotic fibrous dysplasia, which may affect the jaws, and to emphasize the importance of the diagnosis of the disease in the dental office. Two case histories illustrate the problem.

CURRENT CONCEPT OF POLYOSTOTIC FIBROUS DYSPLASIA

Definition • The literature has been overburdened with terms for skeletal diseases. The confusion can be traced[1] to the use in the German literature of the term "osteitis fibrosa" for the lesions found in Paget's disease, hyperparathyroidism, giant cell tumors and polyostotic fibrous dysplasia. Further confusion was added by the German use of "fibrous osteodystrophy" as synonymous with their "osteitis fibrosa."

In the light of present knowledge, two of von Recklinghausen's three cases were probably not hyperparathyroidism but polyostotic fibrous dysplasia.[2]

Lichtenstein[3] found 33 titles used to describe these cases. There were various combinations of osteitis fibrosa, osteodystrophia fibrosa, Recklinghausen's disease, and fibrocystic disease of bone further qualified by such terms as focal, unilateral, disseminated or regional. Most examples of the deforming disease of the skull known as leontiasis ossea are thought to be polyostotic fibrous dys-

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1. Lichtenstein, L., Polyostotic fibrous dysplasia. Arch. Surg. 36:874 (May) 1938.

2. Albright, F., Polyostotic fibrous dysplasia; a defense of the entity. J. Clin. Endocrinol. 7:307 (May) 1947.

3. Lichtenstein, L., and Jaffe, H. L., Fibrous dysplasia of bone; a condition affecting one, several or many bones, the graver cases of which present abnormal pigmentation of skin, premature sexual development, hyperthyroidism or still other extraskeletal abnormalities. Arch. Path. 33:777 (June) 1942.

plasia. Also such terms as juvenile Paget's, adrenal dysfunction and xanthomatosis have been used. Furst[4] gives a review of the literature to December 1942. He states that the disease had been known in Germany before Albright's[5] publication of 1937 and gives references dating back to 1922. In 1937 Albright described a distinct clinical entity which became known as Albright's syndrome. Albright and associates[2, 5, 6] established the identity of a distinct clinical entity in a triad of seemingly dissociated manifestations involving bone, skin and the endocrine system.

1. Bone—multiple destructive lesions characterized by the replacement of bone by fibrous connective tissue. The lesions tend to be unilateral.

2. Skin—nonelevated brown pigmented areas in the skin which also tend to be unilateral and on the same side as the bone lesions.

3. Endocrine—precocious puberty in females.

It seemed to many investigators that Albright was too rigid in his conception of the disease. All three criteria were not present in my second case but still the general picture was one which grouped it with Albright's cases. It could be called Albright's syndrome without precocious puberty in a female.

In 1938 Lichtenstein,[3] working independently in New York, apologetically introduced the term polyostotic fibrous dysplasia. He reported a series of eight cases in which the clinical and histologic pictures were sufficiently alike to establish a distinct clinical entity.

He believed the disease to be primarily one of bone and used *polyostotic* to signify multiple bones lesions and *fibrous dysplasia* to denote some abnormality in development during the fibrous tissue stage of bone formation.

Albright in a discussion[7] stated he did not like any of the terms, including his own. He pointed to the case of Lena Medina of Peru, who gave birth to a child at the age of five. It was found that this child also had cutaneous brown spots and bone lesions. He thought the term polyostotic fibrous dysplasia was inadequate when sexual precocity was the outstanding feature.

At the present time it is agreed that the best term is one descriptive of the predominant bone lesion. Until such time as the cause is known, polyostotic fibrous dysplasia will be used.

The controversial subject of monostotic fibrous dysplasia[8] in the jaws will not be discussed. Whether such entities as ossifying fibromas are really variants of fibrous dysplasia and whether monostotic fibrous dysplasia is just a lesser degree of the same pathologic entity as polyostotic fibrous dysplasia will be left for future clarification.

Etiology • The confusion of terminology of skeletal diseases has been a deterrent to the clinician's interest. The etiology of polyostotic fibrous dysplasia is unknown but this should not add to further disinterest. It should be remembered that from the time von Recklinghausen described hyperparathyroidism in 1891 it was 34 years before the true etiology was proved.

It is agreed that polyostotic fibrous dysplasia is not a variant of some known skeletal disease. Furst[4] reviews and discards the etiologic theories in the literature of atypical Ollier's disease (achondroplasia, skeletal enchondromatosis) and primary hepatic disease. The tendency of

4. Furst, N. J., and Shapiro, R., Polyostotic fibrous dysplasia; review of the literature with two additional cases. Radiology 40:501 (May) 1943.

5. Albright, F.; Butler, A. M., and others, Syndrome characterized by osteitis fibrosa disseminata, areas of pigmentation and endocrine dysfunction. New England J. Med. 216:727 (April 29) 1937.

6. Albright, F.; Scoville, W. B., and Sulkowitch, H. W., Syndrome characterized by osteitis fibrosa disseminata, areas of pigmentation, and a gonadal dysfunction. Endocrinology 22:411 (April) 1938.

7. Kornblum, K., Polyostotic fibrous dysplasia. (Discussion by F. Albright.) Am. J. Roentgenol. 46:145 (Aug.) 1941.

8. Schlumberger, H. G., Fibrous dysplasia of single bones (monostotic fibrous dysplasia). Mil. Surgeon 99:504 (Nov.) 1946.

the bone and cutaneous lesions to be unilateral and spotty in distribution precludes any primary endocrine or metabolic disorder. The theory of abnormality of the bone forming mesenchyme proposed by Lichtenstein explains the bone lesions but not the tendency to unilaterality or the pigmentation or the endocrine dysfunction. Neller's[9] idea of multiple embryonic defects hardly explains the constant occurrence of the classic picture. Albright has proposed to explain the syndrome with a hypothalamic lesion in the region of the third ventricle which would in turn cause abnormal stimulation of the anterior pituitary. In this way the usual findings in polyostotic fibrous dysplasia can be explained as well as the occasional hyperthyroidism as shown in the cases reported here. There seems to be no familial tendency. It is generally agreed that the condition is congenital with strong evidence of an endocrine factor.

Pathology • The periosteum is found to be a thin fibrous sheet and noteworthy only in the lack of a periosteal reaction. The interior of the lesion is found to be filled with a whitish to reddish speckled rubbery and compressible tissue. It may be gritty throughout owing to the presence of metaplastic fibrous bone trabeculae. The basic tissue may vary from richly cellular to poorly cellular, highly collagenous connective tissue. This connective tissue may be loose or in a whorled arrangement. Thin walled small caliber blood vessels are found ranging from few to many. The trabeculae have a random distribution and are variable in size and contour. They stain red with the usual hematoxylin-eosin stain as compared to the blue of lamellar bone. This inadequately calcified osseous tissue appears to be formed by metaplasia of the existing connective tissue and not by osteoblastic activity.[10]

A modification of this basic picture which has been described is the presence of basophilic multinucleated giant cells. These are probably a coalescence of stroma cells and not osteoclasts as there is a noticeable absence of osteoclasts in Howship's lacunae. Also hemosiderin may be found as well as edematous regions and regions of cystic degeneration.

Symptoms • Usually the outstanding symptoms are based on the osseous lesions. Pain, limp and deformity of one of the lower extremities noticed about age 10 are commonly encountered. Pathologic fracture of a femur may be the first symptom as the onset is often insidious. In Furst's[4] Case 1 the first sign was facial asymmetry. The mother noticed that at age 5 the patient's face was more prominent on the right. In another case[11] all the permanent teeth erupted by age 11, except the third molars of both jaws and the maxillary second molars. Neller's[9] Case 1 had an underdeveloped mandible. The dental history and examination are not reported routinely in the published cases so no conclusions can be drawn as to the dental symptoms. In the two cases reported here one came to the dental department because of a toothache, and the other was referred by her physician for biopsy.

The pigmented areas of the skin are usually referred to by the patient as "birthmarks" and are commonly found over buttocks, sacrum and spine. These brown spots have a tendency to be unilateral and on the same side as the bone lesions.

In severe cases of polyostotic fibrous dysplasia which have extraskeletal manifestations the symptoms may be diverse. The outstanding symptom of precocious

9. Neller, J. L., Osteitis fibrosa cystica (Albright). Am. J. Dis. Child. 61:590 (March) 1941.

10. Windholz, F., Cranial manifestations of fibrous dysplasia of bone. Am. J. Roentgenol. 58:51 (July) 1947.

11. Falconer, M. A.; Cope, C. L., and Robb-Smith, A. H. T., Fibrous dysplasia of bone with endocrine disorders and cutaneous pigmentation (Albright's disease). Quart. J. Med. 11:121 (July) 1942.

puberty in females but rarely in males has caused great interest.[12] Apparently the mechanism which releases puberty in the male is different from that which releases it in the female. It is common for the female patients to begin to menstruate at age 2 or 3. This is a true precocity in that there is no loss of fertility, which sharply differentiates it from the precocious puberty caused by adrenal or ovarian tumors.

Diagnosis • The diagnosis is made by the doctor who sees the patient and thinks of polyostotic fibrous dysplasia. He has the responsibility of making the proper diagnosis and thus it becomes necessary that he acquaint himself with these osseous lesions and their differential diagnosis as far as present knowledge will permit.

The great majority of the scattered foci of fibrous dysplasia remain symptom free and are discovered only by routine roentgenographic examination. Thus an unsuspected disease may be revealed accidentally by roentgenograms. In the group of cases reviewed by Falconer[11] 67 per cent had involvement of the face. In severe forms of polyostotic fibrous dysplasia the chance of finding roentgenographic evidence in the jaws is high. In milder forms the incidence of involvement is less in the jaws than in the long bones of the extremities. The diagnosis can be made in the dental office by a follow-up on a lesion revealed in routine dental roentgenograms, or on a suspected case in which the physician refers the patient for completion of the roentgen survey of the body. Rarely does a patient present himself because of facial asymmetry due to a swelling in the jaws.

The appearance of the bony lesion in the roentgenogram may vary greatly. The characteristic lesions are reported as areas of rarefaction resembling bone cysts. It must be remembered that these are not cysts but replacement of bone by fibrous tissue. In Albright's Case 6 three definite cyst-like areas are shown in the mandible. Unfortunately this illustration is a lateral jaw roentgenogram and not an intraoral view which would show better detail. Varying areas of increased density are found, particularly at the base of the skull. Falconer[11] reports the commonest change in the bones of the face is a sclerotic overgrowth and may resemble the appearance seen in Paget's osteitis deformans. In my cases the characteristic was the loss of the irregular cancellous space shadows in the mandible replaced by a "ground glass" appearance.

If connective tissue (radiolucent) has replaced the spongy bone and adjacent inner surfaces of the cortex the area will appear cyst-like. The mottled, cloudy or "ground glass" appearance will depend on the degree of metaplastic ossification. Little can be said at this time regarding the effect on growth and development of the oral organ. There appears to be a tendency for the bone age to exceed the chronologic age in the female but not in the male.[9] In both sexes somatic growth appears to be early accelerated and early arrested.

The laboratory is of little aid in diagnosis except to differentiate polyostotic fibrous dysplasia from hyperparathyroidism. The serum calcium is high normal or slightly elevated, the phosphorus normal and phosphatase normal or moderately elevated. In the absence of liver disease the phosphatase level gives an estimate as to the degree of osteoblastic activity and, therefore, to the extent and activity of bone involvement. A fairly high phosphatase level would indicate an active diffuse lesion while a normal level a quiescent stage. The disease appears to be more active in childhood and early adult life, becoming quiescent with advancing years.

12. Dockerty, M. B.; Myerding, H. W., and Wallace, G. T., Albright's syndrome: (fibrous dysplasia of bones with cutaneous pigmentation in both sexes and gonadal dysfunction in females). Proc. Staff Meet. Mayo Clin. 19:81 (Feb. 23) 1944.

Differential Diagnosis • The roentgenographic appearance of the bony lesions may suggest hyperparathyroidism, Paget's disease of bone, bone cysts, giant cell tumors, monostotic fibrous dysplasia or xanthomatosis.

Other conditions which may be considered are Ollier's disease, neurofibromatosis with osseous lesions, and osteogenesis imperfecta. In none of these conditions are found the combined clinical, roentgenographic and pathologic findings of polyostotic fibrous dysplasia. The diagnosis then depends on an awareness of the condition.

Treatment • As the cause of polyostotic fibrous dysplasia is unknown the treatment is symptomatic. The management of pathologic fractures is the main problem. The standard methods of treatment of these fractures are successful. Curettage of the lesions and replacement by bone chips are to be discouraged on two counts; first, the lesions are too widespread; second, fibrous tissue will reform in the region.

Fig. 1 • Appearance of patient when first examined April 26, 1949

CASE 1

A 50 year old housewife came to the Outpatient Dental Clinic of Los Angeles County General Hospital on April 26, 1949, complaining of toothache (Fig. 1). Two teeth were extracted and a full mouth roentgen survey was made. These roentgenograms showed abnormality in the bony structure of the left mandible. There was a loss of the normal trabecular pattern and a "ground glass" appearance with some mottling. The anterior border, in the right central incisor region, appeared somewhat sclerotic. The alveolar resorption, caries, abrasion, and metal fragments in the right molar areas were noted. (See Figure 2.)

The patient returned to the Dental Clinic on June 15, for investigation of the roentgen finding in the left mandible. In answer to written questions the patient wrote that she had fallen down stairs when 1 year old, injuring her head, and had not been able to hear or speak since that accident. At age 3 she fractured her left forearm. Since then she had sustained three fractures of her legs. She began to menstruate when 2½ years of age. Pigmentation of the left side of the face had been present since birth. Pigmented spots on the lower lip had appeared following a menstrual hemorrhage when the patient was 21. She remembered no abnormality as to the time of eruption or exfoliation of her deciduous teeth, nor was there a history of premature or delayed eruption of her permanent teeth. Healing after previous dental extractions had been uneventful.

Physical examination showed a slightly obese intelligent deaf mute female. There was some prominence of the frontal bones. There was a round fawn colored area of pigmentation over the left side of

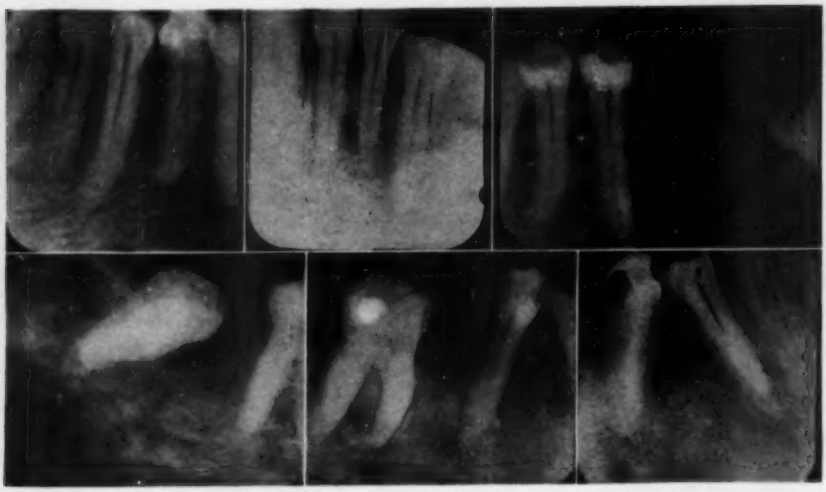

Fig. 2 • Roentgen survey of mandible, showing abnormality of bony structure. There was a loss of the normal trabecular pattern and a ground glass appearance with some mottling. Alveolar resorption, caries, abrasion and metal fragments in the right molar region were noted

the face. Over the sacrum was a 3 by 5 cm. dark brown area of pigmentation with an irregular border. The back showed scoliosis. The lower extremities were shortened and deformed. The membranes of the mouth appeared normal except for areas of brown pigmentation. There was an area 5 mm. long over the edentulous ridge in the region of the lower right first molar. Another about 3 mm. long was in the buccal mucous membrane opposite the lower left second molar. Scattered over the lower lip were four discrete areas of dark brown pigmentation. A tentative diagnosis of polyostotic fibrous dysplasia was made. The lower left second bicuspid was extracted under local anesthesia and a block of tissue anterior to the tooth was removed for microscopic examination. This tissue required slight mallet pressure on the chisel to cut it, but was noticeably softer than normal bone.

The past history showed an admission in 1937 for a left mastectomy because of intracystic papillary adenoma. At that time the laboratory reported a serum calcium of 10, phosphorus of 2.4 and a phosphatase of 8.4. The basal metabolic rate was +42 per cent. She was thought to be an achondroplastic dwarf. In 1942 a low cervical cesarean section was performed for delivery of a normal female child. In 1944 she was hospitalized for a fracture involving the right femur. At that time the serum calcium was 9.7, the phosphorus 2.3 and phosphatase 6.6. Full mouth dental roentgenograms taken in May 1945 showed no material change from the present study.

On July 18, 1949, the patient was admitted to Los Angeles County General Hospital for study. A roentgen bone survey was made which showed involvement of the skull, vertebrae, ribs, tibias, femurs and bones of the forearms. The skull showed considerable patchy osteoblastic proliferation involving the entire

calvaria, mostly on the left side. The outer table was thickened, especially over the anterior skull and vertex. Roentgenograms of the mandible showed several radiolucent regions. There was also osteoblastic proliferation which assumed a somewhat reticulated appearance. Other findings not previously noted were, a palpable mass 2 cm. long beneath the right sternocleidomastoid muscle, bilateral moist rales in the lung bases, a Grade II blowing systolic apical murmur and a palpable spleen. An electroencephalogram was reported normal. An audiogram showed no recognition of sound except at 80 decibel loss in the frequency range from 256 to 512. On this admission the blood iodine was 11.6, the calcium 10.6, phosphorus 3.0 and phosphatase 9.1. On July 19 the lower left third molar was extracted and another biopsy taken from the region mesial to the socket. Both biopsies were reported as fibrous dysplasia of bone (Fig. 3).

Comment • This case presents a typical picture of polyostotic fibrous dysplasia with the complete triad of Albright's syndrome. The finding of hyperthyroidism was of particular interest to the medical department. One pathologist[13] commented that without a history he would have thought of an ossifying fibroma from the microscopic appearance of the biopsy. It appears that healing from dental extraction is uneventful in areas of fibrous dysplasia.

13. Edmondson, H. A., personal communication.

Fig. 3 • Biopsy specimen showing richly cellular connective tissue and inadequately calcified osseous tissue which appears to be formed by metaplasia of the existing connective tissue

Fig. 4 • Appearance of patient when first examined April 15, 1949

CASE 2

A 54 year old white widowed bookkeeper entered Los Angeles County General Hospital on April 15, 1949 (Fig. 4). A tentative diagnosis of recurrent hyperthyroidism had been made, and the patient hospitalized for a study with radioactive iodine. On April 26, 1949, the patient was sent to the Dental Clinic for biopsy of a lesion involving the left mandible. The report was fibrous dysplasia (Fig. 5). The case was diagnosed as polyostotic fibrous dysplasia and a reevaluation was made in the light of the new finding.

The past history was essentially negative. Menstruation had not begun at an unusually early age. The patient's family history was negative. In 1935 a two stage thyroidectomy for a toxic adenomatous thyroid was performed with good results. In 1938 the right femur was fractured, at which time a diagnosis of Paget's disease with pathologic fracture was made. The roentgenologic survey showed enlargement of the mandible with mottling due to irregular nodular regions of increased sclerosis alternating with rarefied regions. At that time the blood calcium was reported as 9.3, the phosphorus 3.6, and the phosphatase 4.4 The fracture did not unite with conservative treatment, and in February 1939 an open reduction was performed. Recovery was uneventful. She had been feeling well until 8 months before admission when she suffered nervousness, fatigue, palpatation and gradual weight loss.

A study in the Outpatient Clinic showed the blood iodine ranging from 6.0 to 9.3 micrograms per 100 cubic centimeters. There was a palpable nodule 2 cm. long in the right pole of the thyroid gland. The pulse was 112 and irregular. The electrocardiogram showed a tendency to left axis deviation. A tentative diagnosis of recurrent hyperthyroidism was made and the patient admitted for a study with radioactive iodine. Two irregular areas of skin pigmentation on the back were noted in addition to the obvious generalized skeletal disease. Polyostotic fibrous dysplasia was suspected.

The roentgenologic survey was repeated, which showed considerable patchy osteoblastic reaction involving the entire mandible, with a large irregular cystoidal region within the body of the mandible on the left measuring 4 cm. in diameter, and numerous small cystoidal regions interspersed with osteoblastic areas of proliferation. Full mouth intraoral roentgenograms were made to complete the survey. The maxillary alveolar process was edentulous except for the left central and lateral incisors and cuspid. The edentulous areas appeared to be within normal limits. There was horizontal alveolar resorption Grade I around the three teeth. There was vertical resorption Grade II on the mesial of the central incisor and above these teeth the process appeared to have finely di-

vided cancellous spaces. The mandibular alveolar process was edentulous except for one tooth, around which was horizontal alveolar resorption. The edentulous areas throughout the mandible had lost their irregular cancellous spaces and there had been an increase in the size of the left mandible from the first bicuspid through the third molar regions. There were some increased densities in the anterior region. (See Figure 6.)

Comment • This is a typical case of polyostotic fibrous dysplasia. It is severe and presents the extraskeletal finding of skin pigmentation, but there was no history of premature menstruation. This illustrates the difficulty in nomenclature as it does not show all three findings of Albright's syndrome. The expanded tumor-like lesion in the body of the left mandible was of particular interest to the dental department.

DISCUSSION

These two cases illustrate the importance of cooperation between the dentist and the physician. In Case 1 the diagnosis was made in the dental department, with medical cooperation requested. In Case 2 the diagnosis was suspected by the physician and specialty consultation requested of the dental department to secure biopsy of bone to establish a final diagnosis. This spirit of cooperation has certainly been in the best interest of the patient and is of special value to the

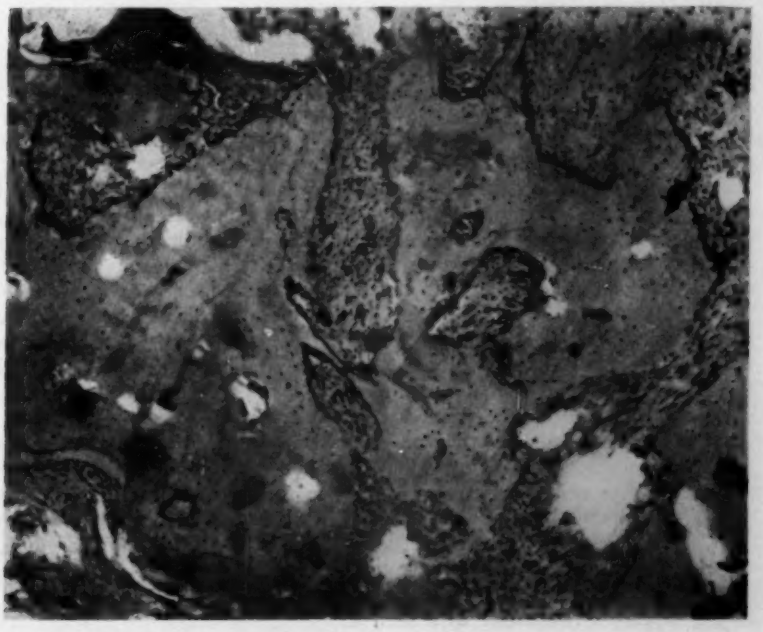

Fig. 5 • Specimen taken from mandible showing connective tissue stroma, metaplastic bone and artifact

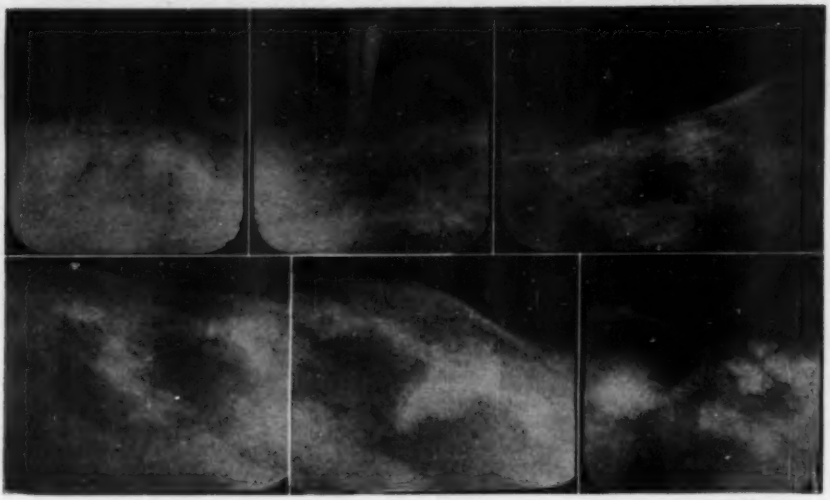

Fig. 6 • Horizontal alveolar resorption around the one mandibular tooth. There were increased densities in the anterior region, and loss of irregular cancellous spaces

medical department when there are oral manifestations of systemic disease.

Polyostotic fibrous dysplasia is not as rare a disease as once suspected. Lichtenstein states that it is the second most frequent, systematized anomaly of skeletal development, being outranked only by multiple exostosis. The hyperthyroidism in these two cases is a rarity as only three cases are reported in the literature.

Pathologists write of the paucity of satisfactory material for study and believe that no progress will be made until sequence material can be studied from an early age. Dentistry has an opportunity here to further medical progress. The physician does not have to wait for his patient to fracture a femur to get a biopsy specimen when lesions exist in the jaws. The patient is far more willing to have study material removed from the jaws than other bones in the body. The dental surgeon's familiarity with such a procedure makes it relatively simple for all concerned.

It must be stressed that roentgen demonstration of bony abnormality is often the first tangible evidence of an underlying systemic disorder that would go undetected if dependent upon clinical manifestations alone. This, plus the fact that the jaws frequently receive routine roentgen examination in the dental office, makes it the duty of the dental profession to be aware of the disease. While fibrous dysplasia roentgenographically may not always be recognized as such, the appearance of the bone leaves little doubt that there is some grave fundamental disturbance.

In these cases a differential diagnosis from hyperparathyroidism can be made by three observations in the dental roentgenograms: (1) there is not the striking loss of the lamina dura which Strock[14] reports; (2) there are areas

14. Strock, M. S., The mouth in hyperparathyroidism. New England J. Med. 224:1019 (June 12) 1941.

which show normal appearing bone; (3) there are areas of increased density as well as decreased density.

Because of superimposition of structures the usual roentgenograms of the skull do not give as accurately a detailed bone picture as do the dental roentgenograms. The physician should be educated to the fact that no roentgen survey is complete without full mouth intraoral roentgenograms. The roentgenologists had made a diagnosis of achondroplasia in Case 1. The dental roentgenograms did not show the abnormalities of growth and development characteristic of achondroplasia but a unilateral loss of normal bone architecture, which led to the correct diagnosis. In Case 2 the roentgenologists' diagnosis of Paget's disease would have been questioned immediately by the dentist knowing that Paget's disease is a rarity in the mandible. It is unfortunate but true that all too often the oral organ is omitted in a physical examination.

1930 Wilshire Boulevard

The Dentist's Interest in Anesthesia • The dentist's interest in anesthesia is a very natural one indeed. Relief from pain is not more urgent in any field of medicine or surgery than it is in dentistry. While some dentists find general anesthesia indicated only occasionally in their practice, there are those specialists in oral surgery who find that general anesthesia is a constant need. The propinquity between these two needs has made these surgeons have more than a passing interest in the subject of anesthesiology. It should be emphasized that the qualities which make for a fine oral surgeon do not necessarily apply to the qualities required for an excellent anesthetist. It is for this reason that it is necessary in some instances to make some adjustments. It is not unheard of for an oral surgeon to become more famous and more proficient as an anesthetist than as oral surgeon. Theoretically at least, if not always practically, the secondary training in anesthesia which an oral surgeon is subjected to can be adequate as his "first love"—dentistry. One of the pitfalls in the training of oral surgeons in anesthesia . . . is that he is likely to treat this field in somewhat the same way as his manipulative work in dentistry—he learns a technic. Consequently, he must be made aware of the fact that the basic psychologic needs of the patient are vastly different when undergoing anesthesia from those when undergoing ordinary manipulative work in the mouth. ***Bernard B. Raginsky, "Some Psychosomatic Aspects of General Anesthesia," Anesthesiology 11:402, July 1950.***

Bone regeneration after cyst removal

Emanuel Bernstein, D.D.S., and Howard B. Moshman,† D.D.S., New York*

Before the introduction of absorbable hemostatic agents in oral surgery, cyst cavities of any appreciable size were kept open by the insertion of gauze drains. Changing the drains and irrigating the wound was time consuming and tedious for both the patient and the operator. If this procedure were not followed, breakdown of the clot would occur before regeneration, with subsequent formation of a so-called dead space.[1,2]

The sources for regeneration of bone are believed to be three in number: the bone surrounding the space; the intact periosteum, and the blood clot, including the cellular elements which have infiltrated from the surrounding tissues. The age of the patient, and the amount of surgical trauma and pathologic destruction to the osteogenic tissues are important factors.[2]

The successful use of absorbable gelatin sponge to form a nucleus for the clot to aid in obliterating dead space has been reported.[3,4] The gelatin sponge, soaked in thrombin solution, in saline solution,[3,4] or dry,[5] has been used.

Correll and Wise[6] tested the compatibility of gelatin sponge with penicillin and found that the potency of the penicillin was not appreciably diminished. Thoma[4] reports using gelatin sponge saturated with penicillin solution (10,000 units per cc.) for infected or contaminated wounds. Used in this manner the sponge is also a vehicle for carrying an antibacterial agent into a cyst cavity.

REPORT OF A CASE

A woman, 66 years of age, complained of pain and swelling of the upper right labial region, which had started two days previously. There was no history of previous swelling in this area. Medical history of the patient was essentially negative. Oral temperature was 100°F.

Examination • Clinical examination disclosed a deep fluctuant swelling, involving the right labial and infraorbital regions. The upper right central incisor had a severe pericementitis; the upper right lateral slightly less. Both teeth gave nonvital responses to electrical pulp testing, and had extensive mobility.

Intraoral roentgenograms revealed a well defined, radiolucent area involving

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1. Cogswell, Wilton W., Dental Oral Surgery. Pittsburgh: Dental Digest Publishing Company, 1932.

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the upper right central and lateral incisors (Fig. 1A). A diagnosis of acutely infected radicular cyst was made.

Treatment • Hot intraoral saline irrigations were advised in conjunction with periodic external cold applications. To sedate the patient, 50 mg. tablets of Demerol, at four hour intervals was prescribed.

The patient reported back later the same day. The swelling had become more massive, with intraoral pointing. The oral temperature had risen to 102.5°F, and pain had increased. 300,000 units of procaine penicillin were administered intramuscularly. An intraoral incision was made and drainage established, with evacuation of a large amount of purulent material. Within 24 hours, temperature was normal and the swelling had decreased appreciably. Iodoform gauze drains were changed daily with saline irrigation.

One week later, the involved teeth were removed and the cyst thoroughly enucleated through a labial flap. It was preserved in Bouin solution for pathological examination. The pathological report confirmed the clinical diagnosis. At this point in the operation, Gelfoam, approximately one-third to one-half the size of the cyst cavity was prepared, and soaked in crystalline penicillin solution (200,000 units per cc.). The Gelfoam was then inserted into the wound, and the soft tissues completely coapted by suturing. No drain was inserted. A postoperative roentgenogram was taken at this time (Fig. 1B).

Recovery was excellent. The patient had no pain or swelling following the operation. The sutures were removed six days later.

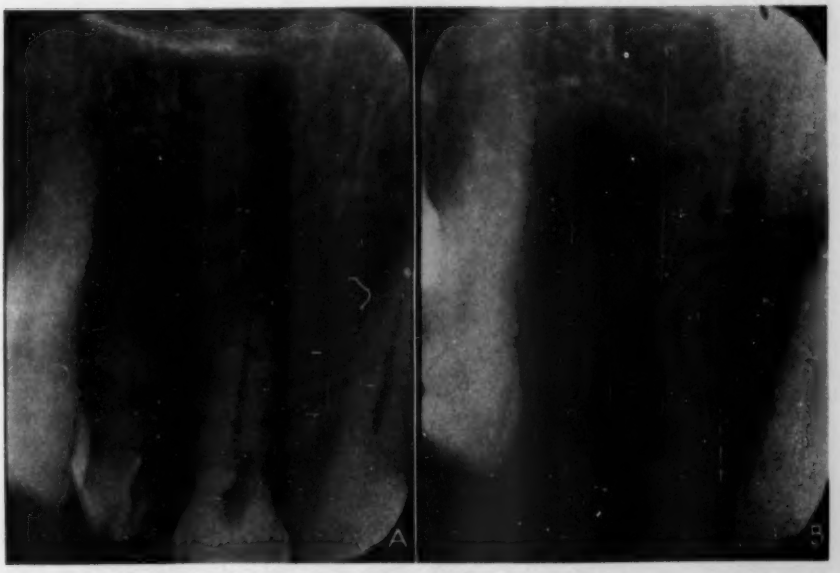

Fig. 1 • Roentgenogram of an acutely infected radicular cyst. A: Before operation. B: Immediately after operation

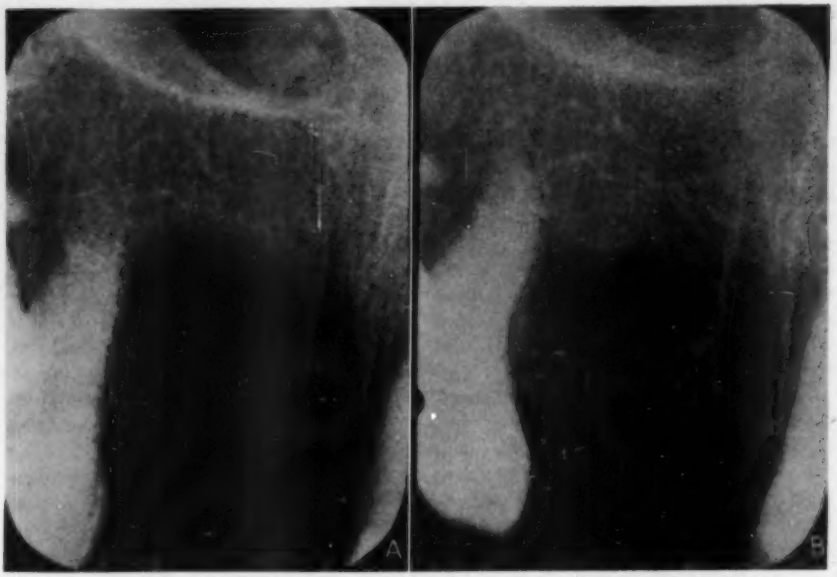

Fig. 2 • Subsequent roentgenograms. A: Three months after operation. No change discernible. B: Six months after operation. Cavity almost filled with new bone

Figure 2A shows the case three months after operation. At this time no change was discernible.

Figure 2B shows the case six months after the operation. The former cyst cavity at this time was almost completely filled with well formed trabeculae of new bone.

DISCUSSION

A case has been presented wherein an acutely infected radicular cyst was successfully treated, keeping postoperative treatment to a minimum. The use of Gelfoam and penicillin eliminated the usual tedious procedure of periodic insertion of drains in an attempt to stimulate granulation and to avoid leaving a dead space. This had the triple function of hemostasis, space obliteration and antibacterial activity.

This case, due to the patient's age and general physical condition had a poor prognosis as far as bone regeneration is concerned. However, the area healed without a depression or deformity, in spite of the fact that the labial plate of bone was completely missing, and a chronic infection of long standing had existed. Replacement of the cavity with fibrous connective tissue would have been considered a satisfactory result. However, it is clearly visible by comparison of the roentgenograms that almost complete bony regeneration has taken place.

JUDICIAL COUNCIL

Revised principles of ethics of the American Dental Association

At the ninety-first annual session of the Association held in Atlantic City October 30 to November 2, the House of Delegates adopted a revised Principles of Ethics. The text of the new instrument, which represents the combined thoughts of the Judicial Council and a committee of the Board of Trustees and which will serve in the future as a guide for the professional conduct of members is presented herewith.

PRINCIPLES OF ETHICS

The practice of dentistry first achieved the stature of a profession in the United States where, through the heritage bestowed by the efforts of many generations of dentists, it acquired the three unfailing characteristics of a profession: education beyond the usual level; the primary duty of service to the public; the right to self-government.

The maintenance and enrichment of this heritage of professional status place on everyone who practices dentistry an obligation which should be willingly accepted and willingly fulfilled. This obligation cannot be reduced to a changeless series of urgings and prohibitions for, while the basic obligation is constant, its fulfillment may vary with the changing needs of a society composed of the human beings that a profession is dedicated to serve. The spirit and not the letter of the obligation, therefore, must be the guide of conduct for the professional man. In its essence, this obligation has been summarized for all time and for all men in the golden rule which asks only that "whatsoever you would that men should do to you, do ye even so to them."

THE DENTIST AS A MEMBER OF A PROFESSION

Section 1. Education Beyond the Usual Level • The right of a dentist to professional status rests in the knowledge, skill and experience with which he serves his patients and society. Every dentist has the obligation of keeping his knowledge and skill freshened by continuing education through all of his professional life.

Section 2. Service to the Public • The dentist has a right to win for himself those things which give him and his family the ability to take their proper place in the community which he serves, but there is no alternative for the professional man in that he must place first his service to the public rather than gain to himself.

Section 3. Government of a Profession • Every profession receives from society the right to regulate itself, to determine and judge its own members. Such regulation is achieved largely through the influence of the professional societies, and every

dentist has the dual obligation of making himself a part of a professional society and of observing its rules of ethics.

THE DENTIST'S DUTIES TO THE PUBLIC

The dentist's primary duty of serving the public is discharged by giving the highest type of service of which he is capable and by avoiding any conduct which leads to a lowering of esteem of the profession of which he is a member.

Section 4. Leadership • The dentist has the obligation of providing freely of his skills, knowledge and experience to society in those fields in which his qualifications entitle him to speak with professional competence. The dentist should be a leader in his community, especially in all efforts leading to the improvement of the dental health of the public.

Section 5. Emergency Service • The dentist has an obligation, when consulted in an emergency by the patient of another dentist, to attend to the conditions leading to the emergency and to refer the patient to his regular dentist who should be informed of the conditions found and treated.

Section 6. Use of Auxiliary Personnel • The dentist has an obligation to protect the health of his patient by not delegating to a person less qualified any service or operation which requires the professional competence of a dentist. The dentist has a further obligation of supervising the work of all auxiliary personnel in the interests of rendering the best service to the patient.

Section 7. Consultation • The dentist has the obligation of seeking consultation whenever the welfare of the patient will be safeguarded or advanced by having recourse to those who have special skills, knowledge and experience. A consultant will hold the details of a consultation in confidence and will not assume responsibility for treatment without the consent of the attending practitioner.

Section 8. Unjust Criticism • The dentist has the obligation of not referring disparagingly to the services of another dentist in the presence of a patient. A lack of knowledge of conditions under which the services were afforded may lead to unjust criticism and to a lessening of a patient's confidence in the dental profession. If there is indisputable evidence of faulty treatment, the welfare of the patient demands that corrective treatment be instituted at once and in such a way as to avoid reflection on the previous dentist or on the dental profession. The dentist has the further obligation of exposing fully at the request of appropriate authorities consequential negligence or incompetence in any form.

Section 9. Rebates, Split Fees and Commissions • The dentist has the obligation of disclosing to his patients all of the elements involved in the establishment of a fee and he may not, therefore, secretly accept rebates, split fees or commissions from any source associated with the service rendered to the patient.

Section 10. Secret Agents and Exclusive Methods • The dentist has an obligation not to dispense or promote the use of drugs or other agents whose composition is secret. He also has the obligation not to dispense or prescribe except for limited experimental purposes any therapeutic agent, the value of which is not supported by scientific evidence. The dentist further has the obligation of not holding out as exclusive, any agent, method or technic.

Section 11. Patents and Copyrights • The dentist has the obligation of making the fruits of his discoveries and labors available to all when they are useful in safe-

guarding or promoting the health of the public. Patents or copyrights may be obtained by a dentist only when their primary purpose is the protection of the public and the profession.

Section 12. Advertising • The dentist has the obligation of advancing his reputation for fidelity, judgment and skill solely through his professional services to his patients and to society. The use of advertising in any form to solicit patients is inconsistent with this obligation because it reflects adversely on the dentist who employs it and lowers public esteem of the dental profession.

Section 13. Cards and Letterheads • A dentist may properly utilize professional cards, announcement cards, recall notices to patients of recent record and letterheads when the style and text are consistent with the dignity of the profession and with the custom of other dentists in the community.

Section 14. Office Door Lettering and Signs • A dentist may properly utilize office door lettering and signs provided that their style and text are consistent with the dignity of the profession and with the custom of other dentists in the community.

Section 15. Announcements • A dentist may properly send announcement cards when there is a change of location or an alteration of the character of practice. Such announcements may be sent only to dentists, members of other health professions or to patients of record. The style and text of such announcements shall be consistent with the dignity of the profession and with the custom of other dentists in the community.

Section 16. Use of Professional Titles and Degrees • A dentist may use the usual titles or degrees (Doctor, Dentist, D.D.S. or D.M.D.) in connection with his name on cards, letterheads, office signs and announcements, but he may not so use his title or degree in connection with the promotion of any drug, agent, instrument or appliance.

Section 17. Use of the Term "Clinic" or "Group Practice" • A dentist may participate in a regularly established clinic or group service, but he may not apply the term "clinic" or similar designation to a dental practice when the use of such term may mislead the public directly or indirectly.

Section 18. Limitation of Practice • A dentist may indicate the limitation of his practice to one of the approved specialties in dentistry on his card, letterhead, announcements and office sign provided that such indication in style and text is consistent with the custom of the dentists of the community.

Section 19. Directories • A dentist may permit the listing of his name in a directory provided that all dentists in similar circumstances have access to a similar listing and provided that such listing is consistent in style and text with the custom of the dentists of the community.

Section 20. Education of the Public • A dentist may properly participate in a program for the education of the public on matters pertaining to dentistry provided such a program is in keeping with the dignity of the profession and has the approval of the dentists of a community or state acting through the appropriate agency of the dental society.

Section 21. Official "Principles of Ethics" • This statement will constitute the "Principles of Ethics" of the American Dental Association. Its constituent and component societies are urged to adopt additional provisions or interpretations not in conflict with these "Principles of Ethics" which would enable them to

serve more faithfully the traditions, customs and desires of the members of these societies.

Section 22. Judicial Procedure • Problems involving questions of ethics should be solved within the broad boundaries established in the "Principles of Ethics," by the component dental society. If a satisfactory decision cannot be reached, the question should be referred, in turn, to the constituent society, the Judicial Council of the American Dental Association and House of Delegates of the American Dental Association, as provided in Chapter I, Section 40, H, of the Bylaws.

Ernest G. Sloman, Chairman

COUNCIL ON DENTAL THERAPEUTICS

Council announces classification of additional products

The classification of products by the Council on Dental Therapeutics of the American Dental Association has been described in a previous report (*J.A.D.A.* 40:489, April, 1950). The Council's program now provides for classification of products in Group A, Group B, Group C and Group D. Products are reconsidered periodically and decisions are subject to change at any time that a substantial amount of new evidence becomes available. The files of the Council contain information on many drugs and dental cosmetics, and inquiries are welcome.

GROUP A

Listing of products in Group A means that at the time of their consideration, the items conformed with the provisions of acceptance established by the Council on Dental Therapeutics and adopted by the Board of Trustees of the American Dental Association. Items in this group will be listed in *Accepted Dental Remedies*, and may use the Seal of Acceptance, unless otherwise provided.

The following additional products are classified in Group A:

Ledercillin Crystalline Procaine Penicillin G Troches, 5,000 Units (Lederle Laboratories Division, American Cyanamid Company): Each troche is stated to contain 5,000 units crystalline procaine penicillin G in a flavored base. See *A.D.R.*, ed. 16, p. 43.

Penicillin G Procaine in Aqueous Suspension, 300,000 Units per cc. (Abbott Laboratories): Each cc. of aqueous suspension is stated to contain penicillin G procaine, 300,000 units, together with suspending and dispersing agents. Marketed in 1 cc. cartridges; 1-dose vials, 5-dose vials and 10-dose vials. See *A.D.R.*, ed. 16, p. 43.

Aureomycin Hydrochloride[1] (Crystalline) Capsules, 50 mg., 250 mg. (Lederle Laboratories Division, American Cyanamid Company): Each capsule is stated to contain aureomycin hydrochloride crystalline powder and excipients. See *A.D.R.*, ed. 16, p. 38. (For report, see page 65.)

1. Patented. Patent No. 2,482,055. See A.D.R. ed. 16, p. iv.

Aureomycin Hydrochloride[1] *(Crystalline) Spersoids, 50 mg.* (Lederle Laboratories Division, American Cyanamid Company): Each 3 grams is stated to contain 50 mg. of aureomycin hydrochloride crystalline powder in a chocolate flavored powder. Trademark: Spersoids. See *A.D.R.*, ed. 16, p. 38. (For report, see this page.)

GROUP B

Listing of products in Group B means that there is insufficient evidence to justify their present acceptance, but there is reasonable evidence of their usefulness and safety. These products meet the other qualifications and standards established by the Council on Dental Therapeutics and the Bureau of Chemistry. It is the Council's opinion that Group B products may be promoted for special use and study.

The following additional products are classified in Group B:

Aureomycin Hydrochloride[1] *(Crystalline) Ointment Topical, 3%* (Lederle Laboratories Division, American Cyanamid Company): Stated to contain aureomycin hydrochloride crystalline powder in an ointment base. See *A.D.R.*, ed. 16, p. 38. (For report, see this page.)

Aureomycin Hydrochloride[1] *(Crystalline) Troches, 15 mg.* (Lederle Laboratories Division, American Cyanamid Company): Stated to contain aureomycin hydrochloride crystalline powder in a flavored base. See *A.D.R.*, ed. 16, p. 38. (For report, see this page.)

GROUP C

Listing of products in Group C means that the evidence is so limited or inconclusive that the products cannot be accurately evaluated. It is the Council's opinion that Group C products require further study by qualified investigators.

GROUP D

Listing of products in Group D means that they are unacceptable because of their demonstrated inability to meet the standards outlined in the provisions for acceptance.

Council classifies oral dosage forms of aureomycin hydrochloride in group A and ointment and troches in group B

A general description of aureomycin hydrochloride[1] appears on page 38 of *Accepted Dental Remedies*, 1951.

It has been demonstrated that aureomycin hydrochloride is effective against many of the infections by streptococci and staphylococci which are found in and about the mouth. There is reason to believe that aureomycin hydrochloride will be especially useful in the treatment of severe infections of this type which do not respond to penicillin. This antibiotic has also been recommended as a prophylactic against transient bacteremias associated with dental extractions. The fact that aureomycin hydrochloride is readily administered by mouth with slight danger of serious toxic effects suggests that this agent will be particularly adaptable to dental use. Some cases of nausea, vomiting and diarrhea have been re-

1. Patented. See A.D.R. ed. 16, p. iv.

ported following use of the drug.

In addition to its effectiveness against bacterial infections, there is growing evidence of the usefulness of aureomycin against virus infections in and about the mouth. The Council does not consider reports to date of the treatment of oral herpetic lesions with aureomycin hydrochloride to be conclusive, but believes that the reports are suggestive of its value for this purpose.

The oral dosage of this antibiotic in severe infections is between 5 and 10 mg. per kilogram of body weight every four hours. The lower dosage schedule may be used in the treatment of mild infections.

The Council believes that the established value of the drug for bacterial infections due to many gram-positive and gram-negative organisms and its potential value against certain virus infections justify classification of forms of aureomycin hydrochloride intended for oral administration in Group A.

Several investigators have reported data on the prevention and treatment of herpes labialis by means of ointments of aureomycin hydrochloride. Other reports on the treatment of recurrent aphthae and cases of necrotic gingivitis using troches of aureomycin have appeared. The Council believes these reports indicate a probable usefulness for aureomycin hydrochloride by the topical route. It believes, however, that aureomycin hydrochloride products for topical application should be classified in Group B until further well-controlled confirmatory evidence is available to warrant their reclassification.

COUNCIL ON DENTAL EDUCATION

Additional dental internship and residency programs approved

The Council on Dental Education and its Committee on Dental Internships and Residencies have reviewed the applications from a number of hospitals for approval of their educational programs. These hospitals have had their dental departments approved by the Council on Hospital Dental Service and the inspectors of that Council have inspected the educational program and facilities of these hospitals. These inspectors have reported on the manner in which these programs agree with the Requirements for the Approval of Hospital Dental Internship and Residency Programs developed by the Council on Dental Education and approved by the House of Delegates of the American Dental Association. Also, the Council on Hospital Dental Service has recommended to the Council on Dental Education that the internship and residency programs under consideration be approved.

The Council on Dental Education and its Committee on Dental Internships and Residencies voted at a meeting held at Atlantic City on October 26 and 28, 1950 to approve the educational programs in the hospitals listed in the table. The area or areas for which approval has been given, as well as the type of program, are also indicated.

Table • Hospitals and programs which have been approved

Hospital	Type of program	
	Internship	Residency
Jefferson-Hillman Hospital 619 South 19th Street Birmingham, Alabama J. F. Volker, D.D.S., Dean University of Alabama, School of Dentistry	Straight Oral surgery	Straight Oral surgery
U. S. Marine Hospital 15th and Lake Street San Francisco, California F. R. Jackson, D.D.S., Chief Dental Service	Rotating Oral surgery Pedodontia Restorative dentistry Periodontia Endodontia Dental roentgenology Oral pathology Prosthetic dentistry	
Waterbury Hospital 64 Robbins Street Waterbury, Connecticut Irving E. Wallace, D.D.S., Dental Administrator	Straight Oral surgery	
Gallinger Municipal Hospital 19th and Massachusetts Avenue, S.E. Washington 3, D. C. A. Merril, D.D.S., Dental Officer	Straight Oral surgery	
Florida State Hospital Chattahoochee, Florida A. F. Douglas, D.D.S., Chief Dental Service	Rotating Oral surgery Anesthesia Oral pathology Prosthodontia Periodontia Endodontia Roentgenology	
U. S. Marine Hospital 4141 Clarendon Avenue Chicago 13, Illinois Joseph E. Unsworth, D.D.S., Senior Dental Surgeon; Chief Department of Dentistry	Rotating Oral surgery Dentistry for children Anesthesia Oral pathology Prosthodontia Periodontia Endodontia Roentgenology Operative dentistry Crown and bridge	
Louisville General Hospital 323 East Chestnut Street Louisville, Kentucky R. M. Herd, D.D.S., Director Dental Department	Mixed Anesthesia Dentistry for children Endodontia Oral surgery Radiology	Mixed Anesthesia Dentistry for children Endodontia Oral pathology Oral surgery Radiology

Table • Hospitals and programs which have been approved (continued)

Hospital	Type of program	
	Internship	Residency
U. S. Marine Hospital 210 State Street New Orleans 15, Louisiana L. R. Etzenhouser, D.D.S., Senior Dental Surgeon; Chief Department of Dentistry	Rotating Oral surgery Dentistry for children Anesthesia Oral pathology Prosthodontia Periodontia Endodontia Roentgenology Operative dentistry Crown and bridge	
U. S. Marine Hospital Wyman Park Drive and 31st Street Baltimore 11, Maryland R. S. Lloyd, D.D.S., Chief Dental Service	Rotating Oral surgery Dentistry for children Anesthesia Oral pathology Prosthodontia Periodontia Endodontia Roentgenology Operative dentistry Crown and bridge	
Sinai Hospital of Baltimore, Inc. Baltimore 5, Maryland A. H. Berman, D.D.S., Chief Dental Department		Straight Oral surgery
Buffalo General Hospital 100 High Street Buffalo 3, New York Charles A. Pankow, D.D.S.	Straight Oral surgery (to include periodontia)	Straight Oral surgery (to include periodontia)
Mount Sinai Hospital 5th Avenue and 100th Street New York, New York Leo Stern, D.D.S., Chief Dental Service	Rotating Oral surgery Orthodontia Anesthesia Oral pathology Prosthodontia Periodontia Endodontia	
Rhode Island Hospital Eddy Street Providence, Rhode Island G. H. Denicourt, D.M.D., Chief Dental Service	Mixed Roentgenology Diagnosis Endodontia Minor oral surgery Surgical prosthesis Operative dentistry Dentistry for children	

COUNCIL ON DENTAL TRADE AND LABORATORY RELATIONS

The dental laboratory issue: V. The meaning of accreditation

There is nothing mysterious, sinister or destructive in the accrediting process widely employed in this country in secondary, higher and professional education. Indeed, accreditation has been highly salutary in fixing standards of accomplishment in colleges and professional schools and has served a very practical and useful purpose. Accrediting by detached voluntary agencies has been almost coterminous with the licensing in the states under law by practitioners of the several learned professions. This development has largely taken place in the first half of the twentieth century.

Medicine perhaps affords the best example. Medical practice acts have now been on the statute books of all the states many years. They are very similar in their basic requirements and commonly fix the terms of licensing, in order to safeguard life and health, as to the age, character, education, and fitness of the applicant. In all cases provision is made for preprofessional education touching both secondary and collegiate training and a stated period of professional study.

The accreditation of secondary schools and liberal arts colleges arose gradually in response to the practical needs of the several states for lists of such institutions acceptable for the high school and college training required by law for prospective physicians and gradually also for like training to meet the requirements in other professions. A few states, notably New York, possessing the administrative machinery for the purpose, undertake to accredit educational institutions throughout the country on their own account. The practice in most states, however, is to adopt as their own the lists of accredited institutions announced by voluntary accrediting agencies. The trend in the few states able to administer their own standards is toward greater and greater reliance upon the findings of the voluntary agencies.

Thus widely acceptable standards in secondary and collegiate education are set by five regional accrediting agencies which now practically cover the entire country. These voluntary associations, without legal standing except as associations, exert tremendous moral force. They are the New England Association of Colleges and Secondary Schools; the Middle States Association of Colleges and Secondary Schools; the North Central Association of Colleges and Secondary Schools; the Southern Association of Colleges and Secondary Schools and the Western Association of Colleges and Secondary Schools. Thus the entire country is practically covered by these voluntary agencies which fix standards and regularly issue lists of accredited secondary schools and colleges. The stamp of approval given a high school or a liberal arts college by one of these regional associations is universally accepted. Accreditation in this area has been of immeasurable value, not only in elevating standards and in the elimination of weak institutions, but also in affording a safe guide to state departments of education, to boards of examiners and other agen-

This article is the fifth in a series of six prepared by the Council on Dental Trade and Laboratory Relations on the relationship between dentistry and one of its most important auxiliaries.

cies responsible for the admission of students to the study of medicine and other professions. It is rare indeed that a liberal arts college engaged in bona fide educational work does not eagerly seek the approval of its regional accrediting agency.

The accrediting process is perhaps seen at its best in the effect it has had upon medical education. In 1906 when Abraham Flexner completed his notable study of medical education there were about 160 medical schools in the United States and Canada. Many of them were commercial enterprises, requiring high school graduation or less for admission and operating under standards beneath notice by reputable educational institutions. The work of the Council on Medical Education and Hospitals as an accrediting agency, with the cooperation of the Association of American Medical Colleges, has brought about a complete revolution in medical education in the intervening years.

The Educational Number of the *Journal of the American Medical Association* for September 9, 1950 shows that there are 81 accredited medical schools in the United States and Canada, all but 6 of which are university institutions. The minimum admission requirement of two years of study in liberal arts is exceeded by applicants voluntarily, the great majority of medical students now being college graduates. The commercial school and the half-hearted enterprises have disappeared entirely. It is not too much to say that American and Canadian medical education now lead the world. This situation has come about fundamentally through the intelligent administration of a detached voluntary accrediting agency.

Like progress could be shown in other professions through the same means, notably in the activities of the Engineers' Council for Professional Development and the Council on Dental Education of the American Dental Association. Engineering schools and dental schools throughout the United States have attained a standard of excellence and the almost universal dignity of university relationship through the activities of these accrediting bodies.

The accreditation of commercial dental laboratories by a detached agency such as the Council on Dental Trade and Laboratory Relations is a perfectly natural and logical development. Hostility to the movement on the part of some laboratories and indifference on the part of some dentists are hard to understand. Reputable laboratories, of which happily the number grows, desire to serve the dental profession solely and to be free from any attempt to practice dentistry as defined by law. Moreover, this growing number of laboratories desires to meet the demands of the dental profession for prompt service, good workmanship and ethical behavior. The dental profession as exemplified by the actions and pronouncements of the American Dental Association desires to recognize the legitimacy of the laboratory industry and to cooperate with the laboratories in the attainment of the common end of a high level of dental service to the American people.

It is entirely in line with the accrediting process in other fields for an agency of the American Dental Association to put its stamp of approval upon the work and conduct of a dental laboratory. The process calls for mutual good faith. The laboratory must want and seek accreditation. The accrediting body must deal fairly with all applicants. If the salutary experience of other agencies is to be expected the large number of laboratories which are worthy of recognition will receive it and the bootlegging laboratory will gradually disappear.

Because of the vast extent of the accreditation problem on a national scale the House of Delegates of the American Dental Association, on the recommendation of the Council on Dental Trade and

Table • Distribution of population, dentists, laboratories and technical workers*

State	Population	No. of dentists	No. of laboratories	No. of technical workers
Alabama	3,061,743	712	34	193
California	10,586,223	7,266	609	2,565
Florida	2,771,194	1,138	64	483
Georgia	3,444,578	882	61	175
Indiana	3,934,224	1,973	105	643
Michigan	6,371,766	3,340	220	1,500
Missouri	3,954,653	2,571	89	602
New York	14,830,192	13,797	1,219	7,843
North Carolina	4,061,929	967	70	400
Ohio	7,946,627	4,157	204	1,183
Pennsylvania	10,498,012	6,550	229	2,019
Washington	2,378,963	1,563	73	401
Total in 12 states	73,840,104	44,916	2,977	18,007
Total in U. S.	150,697,361	84,137	5,056	29,124
Per cent in 12 states	49	53	59	62

*Based on report of the Bureau of Economic Research and Statistics, J.A.D.A. 39:489 (Oct.) 1949, on figures compiled by the Dental Laboratories Institute of America and on report of the Bureau of Census.

Laboratory Relations, authorized at its recent meeting at Atlantic City the administration of the accreditation plan on the state level. Under this plan all details of accreditation in a state will fall under the direction of the prosthetic dental service committee of the state dental society under the broad principles established by the American Dental Association. Due consideration will be given to the relations already existing between dentists and laboratories in a given state. The basic requirements which will prevail generally under the guidance and direction of the Council on Dental Trade and Laboratory Relations call for (1) the observance of the current dental laws of a state by both laboratories and technicians; (2) conformity by the laboratory to the regulations and prevailing standards of sanitation, health, labor and safety of the state and community in which it operates; (3) limitation of the service of the laboratory to legal practitioners of dentistry in compliance with written instructions; (4) the strict limitation of advertising to the dental profession; (5) the observance of a prescribed code of ethics and (6) the employment by the laboratory of a staff of trained technicians with equipment adequate for the prosecution of the work undertaken.

It is well known that hundreds of laboratories are operating voluntarily on a basis which will enable them, on application, to be accredited promptly. There is absolutely nothing in the broad requirements, nor will there be in the state administration of the plan, to hinder the laboratory genuinely desirous of serving the dental profession in the conduct of its business. The end result of accreditation, if it can be gradually employed in each state, will be the complete elimination of the price-cutting, unethical, unqualified laboratory which engages in the backdoor practice of dentistry contrary to law and has no respect for any code of its own or for the widely observed Principles of Ethics of the American Dental Association. Responsibility for the success of the accreditation plan rests equally upon the laboratory industry and the dental profession. Burden of proof rests

heavily upon dentists, laboratories and technicians alike who refuse to see in the accreditation plan an honest and promising effort to bring order out of chaos and peace out of unnecessary make-believe war.

There is good prospect that the state level plan now to be administered will take hold gradually throughout the country. During the last year the original plan on the national basis was in operation in Alabama, Florida, Missouri, North Carolina and Washington. The state level plan is already in operation in New York, Ohio and Southern California. Early adoption of the state level plan is expected in Georgia, Indiana, Rhode Island and Wisconsin. Michigan and Pennsylvania are developing other means of cooperation between dentists and laboratories which may have the same end result as accreditation. If, as is to be hoped, the movements under way in these states extend to the accreditation or other recognition of all reputable laboratories, a pattern will emerge which may become acceptable in all states. Forty-eight per cent of the population in the United States, 53 per cent of the dentists, 59 per cent of the dental laboratories and 62 per cent of the technical workers in the laboratories are to be found in the states shown in the accompanying table.

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LON W. MORREY, D.D.S., EDITOR
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THE Journal OF THE AMERICAN DENTAL ASSOCIATION

Editorials

America, at midcentury, evaluates its services to youth

The purpose of the Midcentury White House Conference on Children and Youth held in Washington, D.C., December 3 to 7 was to consider how the country "can develop in children the mental, emotional and spiritual qualities essential to individual happiness and to responsible citizenship, and what physical, economic and social conditions are deemed necessary to this development." Boiled down, this ethereal object simply means "Let's get together and make America an even better place in which to live."

More than 5,000 delegates from every state and territory in the Union subscribed to the purpose of the Conference and pledged allegiance to the cause of children. However, mere pledging is insufficient. The true worth and the ultimate value of the Conference will be measured by the improvement in present community programs for children and by the number of new and effective programs developed in their behalf.

As might well be expected a scarlet thread of concern regarding the political implications of the meeting ran through the fabric of the Conference. However, even though Oscar R. Ewing, chairman of the executive committee, might be somewhat inclined, as evidenced by his past actions, to convert the findings and recommendations of the delegates to the purposes of the Federal Security Agency of which he is director, there is small likelihood that his desires, if he has such desires, will materialize. The delegates, representing a cross section of American life, patently were more interested in the purpose for which they were called to Washington than

in becoming party to the personal and political ambitions of one man or the aspirations of one political party.

The first Conference, called by President Theodore Roosevelt in 1909, stimulated the creation of the Children's Bureau in the Federal Government. The second, called by President Woodrow Wilson in 1919, formulated the first important body of child health and child welfare standards. The third, called by President Herbert Hoover in 1930, created a Children's Charter and advanced the cause of pediatrics. The fourth, called by President Franklin D. Roosevelt in 1940, highlighted the services necessary for the well-being of children. Thus all of the thinking, planning and measures developed by leaders in child development during the past half century formed the background for the present Conference.

Although the decade since the fourth White House Conference was one of war and the preparation of defenses, considerable improvement was made during those years in both the quality and quantity of health, welfare and educational services provided for children. Dentistry particularly can be proud of its contributions to child health during the past ten years, as in that period more minds and more money were devoted to dental research than in any previous decade in the history of the profession. During that period dentistry for the first time was able to give society an effective agent, sodium fluoride, for the partial prevention of dental caries.

Dental societies now have within their grasp an unprecedented opportunity to aid their communities in reducing the incidence of childhood's most prevalent disease. If the 483 component dental societies of the Association do nothing more than motivate their civic authorities to fluoridate their communal water supplies and educate parents to provide their children with topical applications of sodium fluoride, they will have contributed much to the fulfilment of the objectives of the Midcentury White House Conference on Children and Youth.

Orally administered salt solution in treatment of burn shock

The recent recommendation of the United States Public Health Service regarding the use of salt solution in cases of severe burns provides society for the first time with a simple, inexpensive and effective aid in the treatment of burn shock. The treatment, described in the October 13, 1950, issue of *Public Health Reports,* consists of the oral administration of copious amounts of hypotonic salt solution to burn victims. As much as 10 liters of the solution have been given severely burned adult patients in a 24 hour period.

The announcement of this simple adjunctive agent comes at an opportune time. The present international tension, which, if it breaks, may bring atomic war, makes it imperative that every member of the healing profession be prepared to administer this treatment should a large scale civilian disaster occur.

The solution is made by dissolving 3 to 4 Gm. of sodium chloride and 2 to 3 Gm. of sodium citrate in a liter of water. Ordinary baking soda may be substituted for the sodium citrate. Thus, three of the most readily available and inexpensive of in-

gredients—salt, baking soda and water—may be employed successfully in the treatment of a condition which long has been one of the most difficult and discouraging faced by the medical profession.

Officials of the United States Public Health Service caution however that:

> The concentration of salt should not be in excess of 140 milliequivalents of sodium per liter. If the concentration is above this, vomiting and diarrhea become important complicating factors.
>
> Whenever profound peripheral circulatory collapse is present, the intravenous route of administration must be used until peripheral blood flow has been reestablished. . . . In addition to the salt solution or plasma intravenously, whole blood is given concurrently whenever peripheral circulatory collapse exists. This materially implements the effectiveness of salt solutions. The slightly hypotonic salt solution is the only drinking fluid permitted the injured individual until the edema of the injured parts begins to subside. Certain exceptions to this rule have to be made during the hot weather of summer when it is sometimes necessary to permit the partaking of some non-salty water.

The catastrophe of Nagasaki may not happen here but only the most unwise will refuse to question its possibility. Should that possibility become a reality, dentists will be called on heavily to administer to the casualties. Now is none too soon for all members of the profession to familiarize themselves with the technic of this new treatment.

National children's dental health day

The first Monday in February again has been designated by the House of Delegates of the Association as National Children's Dental Health Day. Senator James E. Murray (D., Mont.), Representative Thomas J. Lane (D., Mass.) and Senator Owen Brewster (R., Maine) have introduced bills in Congress to establish this date officially and President Truman has been requested to proclaim it so. The Council on Dental Health and the Bureau of Public Information of the Association have distributed quantities of educational and promotional material to participating organizations and most state and component dental societies are now completing their program planning for the occasion.

Never before has the profession been so well prepared to advance the cause of dental health for children. The dramatic developments in water fluoridation research reported in recent months provide a new and effective method of reducing the incidence of childhood's most prevalent disease.

February fifth may be used to stimulate communities to improve their present dental program for children and to initiate new ones. To be effective such programs, established on a year round basis, should be designed (1) to educate parents to provide children with early and regular dental care, (2) to motivate communities to establish dental caries prophylactic service for all children and corrective service for the underprivileged, and (3) to stimulate members of the profession to practice more pedodontics. The last provision is particularly important. It does little good for a dental society to proclaim dentistry for children unless all dentists in the community provide it.

MIDCENTURY WHITE HOUSE CONFERENCE ON CHILDREN AND YOUTH

More than 5,000 delegates, representing some 400 national, state and local organizations plus some 250 delegates from 41 foreign countries, met in Washington, D. C., December 3-7 at the invitation of President Truman to participate in the fifth White House Conference on Children and Youth.

The central concern of the Midcentury Conference was to provide each child with a fair chance to achieve a healthy personality. The five-day session was devoted to a consideration of "how we can develop in children the mental, emotional and spiritual qualities essential to individual happiness and to responsible citizenship, and what physical, economic and social conditions are deemed necessary to this development." This fifth decennial conference was unique in that for the first time youth was heavily represented and participated equally with adults in a discussion of their needs, desires and problems.

Federal Security Administrator Oscar R. Ewing, chairman of the national committee of the Conference, in his opening address advised the audience of experts in child care, psychology, medicine, sociology, education and community affairs that "the ultimate value of the Midcentury Conference depends upon the success with which the delegates convert their own recommendations into practical benefits for children and young people."

President Truman, who addressed one of the general assemblies, spoke solemnly of the Korean situation and the grave risk of a third world war. Speaking before a capacity audience he warned that "we cannot insulate our children from the uncertainties of the world in which we live or from the impact of the problems which confront us all."

Referring to the four previous conferences, Mr. Truman said that they "have made our democracy work better," and added, "Nothing this conference can do will have a greater effect on the world struggle against communism than spelling out ways in which our young people can better understand our democratic institutions. We must teach them why we must fight, when necessary, to defend our democratic institutions."

The 500 delegates listened to 16 addresses delivered in seven general sessions, participated in 31 panel discussions and broke up into 35 work groups each of which held four meetings.

Several hundred resolutions, recommendations and suggestions, prepared by the work group and panel participants, were winnowed and streamlined into 66 recommendations by the Committee for Conference Recommendations. These recommendations formed the platform for the Conference and were presented to and adopted by the delegates at a plenary session on the last day of the meeting. A few of the recommendations, in brief, are as follows:

Discrimination. Every method should be used to teach youth not to make other people objects of hatred and prejudice.

Infancy and Early Childhood. A conference should be called by a voluntary national agency to plan legislation for day care of children under six.

Adolescence. Investigation is needed to find out how much of the emotional conflict of adolescence is inevitable. Adults, youths and professional workers should be represented on curriculum planning committees.

Schools. Needs of schools for critical materials should yield priority only to military needs. There should be immediate enactment of Federal aid to education.

Religion. Churches and synagogues should give youth more participation in their organizations.

Working Conditions. States should pass and enforce more stringent laws to regulate youth labor.

Communications. The Federal Communications Commission should act favorably on the request for educational television channels.

Police. The police should be trained in work with young people and should be included in all levels of community planning for youth.

Housing. There should be continued support for Federal slum clearance and urban development.

Economics. Price and rent controls are needed in the current emergency.

Health. Action should be taken at the national level to supplement state and local funds in the early development of adequate health services.

DENTAL PARTICIPANTS

Dentistry was well represented at the Conference by the following members: Harold Addelston, New York; David B. Ast, New York; H. Trendley Dean, USPHS; Norman H. Denner, Ohio; Russell A. Dixon, D. C.; Leigh C. Fairbanks, D. C.; M. J. Friedman, Arkansas; John T. Fulton, Children's Bureau; Allen O. Gruebbel, Illinois; Maynard K. Hine, Indi-

ana; John W. Knutson, USPHS; Hugo M. Kulstad, California; Richard R. C. Leonard, Maryland; George B. Moore, Michigan; Lon W. Morrey, Illinois; Thad Morrison, Sr., Georgia; Lyle Pettit, Ohio; Jack A. Salzmann, New York; Arthur R. Sample, Tennessee; Carl Sebelius, Tennessee; and Annie Taylor, Georgia.

Members of the dental group presented the following recommendation with the request that it be incorporated in the final report of the Conference:

There are three important and integrated aspects of dental health which relate to the healthy development of the individual:

1. The individual's responsibility
   a. Proper diet
   b. Good mouth hygiene
2. The dentist's responsibility
   a. To provide proper dental care for those who seek his services
   b. To participate in community planning and implementation of community programs
3. The community's responsibility
   a. To promote dental health education
   b. To establish dental caries prophylaxis programs such as water fluoridation, topical fluoride programs in schools
   c. To provide dental corrective care for those who cannot purchase this service privately
   d. To support expansion of basic dental research and the development of more effective measures for preventing, treating and controlling dental diseases

Allen O. Gruebbel, secretary of the Council on Dental Health, participated with D. A. Dukelow and Robert C. Hood of the American Medical Association, Pearl McIver of the American Nurses Association and Dallas Sutton of the American Hospital Association, in a well attended symposium on "The Implications of the Conference for the Conduct of Health Services."

In closing the Conference, Katharine F. Lenroot, chief of the Children's Bureau, Social Security Administration, Federal Security Agency, stated that the Midcentury Conference demonstrated the need for and possibility of bringing together in different fields, scientific methods and professional skills in the service of the child.

Plans are well under way to publish the complete transactions of the Conference early next year and to establish a national nongovernmental committee to follow up the work of the Conference during the next decade.

Washington News Letter

This country's commitment to a war footing mobilization portends a faster tempo of Washington developments in 1951 bearing on the health sciences in particular, as well as the population in general. Dentistry no less than the other professions will be affected, from the civilian as well as the military standpoint, by accelerated enlargement of the Armed Forces now under way. The same is true with reference to mustering of skill for implementation of civil defense in urban centers.

Since the attitude of the new Congress will be to reduce non-defense spending to the bone, one may anticipate sharp retrenchment in Federal subsidization of research and teaching in dental schools; in the Veterans Administration's fee-for-service dental care program, and in financial aid to the states for topical fluoridation demonstrations and other preventive dentistry projects.

Somewhat more distant on the horizon but looming as distinct possibilities are national service legislation, universal military training and unprecedented manipulation of the nation's medical and dental manpower, all directed toward achievement of a maximum effort such as the United States has never before been forced to make. With emphasis being placed on prompt action, whether it be in relation to manpower, industrial changeover or economic reform, long range measures appear to be doomed. It is for this reason that legislation providing for Federal support of dental schools as a means of increasing the number of graduates in 1955 and thereafter seems destined to be sidetracked this year, notwithstanding the fact it almost passed Congress in 1950.

PRESCRIPTION REGULATION

Amendment of Food and Drug Administration regulations dealing with refillability of dentists' and physicians' prescriptions is expected to be made in near future. Notice of proposed changes was given early in December, with a January 5 deadline being fixed for receipt of comments from interested individuals and organizations.

The changes are highly technical but their purpose is simply to clarify circumstances in which a prescription may be refilled once, twice or oftener without separate authorization by the doctor. They were ordered by Federal Security Administrator Oscar R. Ewing, following complaints by the American Pharmaceutical Association that regulatory clarification was sorely needed to end confusion over refillability of prescriptions for barbiturates and certain other dangerous drugs.

GOVERNMENT BUDGET

Government's budget for the fiscal year 1951-52, due to be sent by the White House to Congress the first week in January, will curtail expenditures for grants-in-aid to stimulate dental research. The economy program also precludes any appropriation for construction of a separate building to house the National Dental Research Institute at suburban Bethesda, Md.

CHILDREN'S DENTAL HEALTH DAY

The distinction of being the first bill introduced in the Senate when the final session of the 81st Congress was convened on November 27 was claimed by S.4194,

which would make National Children's Dental Health Day an annual observance by Presidential proclamation. Such a proclamation was issued by the White House last February but the law made no provision beyond 1950.

S 4194, introduced by Sen. James E. Murray (D., Mont.), amends the law so as to have the day officially celebrated "on the first Monday in February of each year." Shortness of the November-December short session of Congress precluded enactment of the amendment but in all probability the bill will be reintroduced this month.

NEW NAVY PUBLICATIONS

Recent government publications include a *Handbook for Dental Prosthetic Technicians,* a 460-page manual prepared by the Naval Dental School primarily for the purpose of training hospital corpsmen attached to dental activities. The volume is illustrated and may be purchased ($1.25) from the superintendent of documents, Government Printing Office, Washington 25, D.C.

Navy also is responsible for a *Color Atlas of Pathology,* first volume of which was published in December. The second and third volumes will cover dental and medical specialties; the first one is general in scope. Publication of the second two volumes is not expected before 1952.

HARMFUL CHEMICALS IN FOOD PROCESSING AND PRESERVATION

Fred D. Miller, of Altoona, Pa., was the first dentist to present testimony before a special House committee which has launched an extended investigation of the use of potentially hazardous chemicals in the processing and preservation of foods. He went before the Delaney committee on December 5, sounding a warning that a definite link has been established between caries and certain food additives. Testifying as an individual but identifying himself as a member of the American Dental Association, the Pennsylvania Dental Society, consulting dental surgeon of the Pennsylvania Railroad and a member of numerous professional associations, Dr. Miller emphasized the role played by nutritional deficiencies in the etiology of dental diseases.

Sugar, refined flour and carbonated drinks were singled out by the witness as nutritional culprits, with particular reference to dental caries. He recommended that they be taxed as luxuries and that soft drinks be labeled as to their phosphoric acid content.

Armed Forces

DOUBLING OF DRAFT QUOTA MEANS NEED FOR MORE DENTISTS: ADVISORY COMMITTEES TO SELECTIVE SERVICE WILL CONFER IN WASHINGTON

With the announcement December 12 that the January draft call had been increased from 40,000 to 80,000, and the February draft call from 50,000 to 80,000 men, it is assumed that the earlier request by the Army for 500 dentists by January 15 will be increased proportionately.

By mid-December the Air Force had stopped accepting applications for reserve commissions from physicians and dentists registered with Selective Service and placed in Priority I. The Air Force will continue to accept applications for reserve commissions from dentists in Priorities II, III and IV, and also for regular commissions from qualified dentists, according to Maj. Gen. Harry G. Armstrong, Surgeon General of the Air Force.

The Federal Civil Defense program also was being expedited. Civil defense legislation is reported on page 89.

STATE ADVISORY COMMITTEES TO CONFER IN WASHINGTON

Members of the State Advisory Committees to Selective Service are scheduled to meet in Washington January 12 with the National Advisory Committee headed by Howard A. Rusk of New York.

Following a meeting of the National Advisory Committee in Washington in late November, Dr. Rusk stated that the State and Local Advisory Committees are now functioning in all of the states and territories. He reported that National Selective Service Headquarters had requested local Selective Service boards to reopen and consider anew the case of any special registrant at any time prior to the issuance of an order for induction if the State and Local Advisory Committees submit evidence in the case and request that it be considered. He emphasized that there are no blanket policies regarding interns, residents and essential teaching and research personnel, but that each case is being considered on the individual registrant's essentiality to the maintenance of the national health, safety, or interest. State Advisory Committees are working effectively with local boards, he said.

"DOCTORS" NOW "PHYSICIANS" IN NATIONAL COMMITTEE NAME

An executive order of the President on December 1 directed that the full name of the National Advisory Committee to Selective Service be changed to "National Advisory Committee on the Selection of Physicians, Dentists and Allied Specialists." The name, which originally included the word "doctors," was changed at the instigation of the Association through Brig. Gen. Louis H. Renfrow, deputy director of Selective Service.

DEFENSE DEPT. STANDARDIZES MILITARY DENTAL PROCEDURES

The Defense Department has issued specifications for conducting dental ex-

aminations, and for dental classifications of individuals, by the Army, Navy and Air Force, in order to assure uniformity among the services.

Four types of examination are specified. Type 4, or screening examination, consists of mouth mirror and explorer or tongue depressor examination under available illumination. Type 3, or modified routine examination, is similar to Type 4 but must be done with adequate natural or artificial illumination. Type 2, or routine examination, adds posterior bitewing roentgenograms, and periapical roentgenograms when they are indicated. Type 1, or ideal examination, includes percussion, thermal and electrical tests, transillumination, and study models, when these are indicated, in addition to full mouth intraoral, periapical and posterior bitewing roentgenograms.

Five dental classifications of individuals are to be used. In Class 1 are individuals requiring no dental treatment. In Class 2 are those requiring routine but not early treatment. Class 3 includes those requiring early treatment; Class 4 comprises those requiring essential prosthetic appliances, and Class 5 includes those requiring emergency dental treatment.

NAVY ISSUES FIRST VOLUME COLOR ATLAS OF PATHOLOGY

A six-year project of the Naval Medical School resulted in the publication last month of the first volume of a three-volume *Color Atlas of Pathology*. The volume covers the oral cavity, as well as hematology, spleen and thymus, lymph nodes, tonsils, the respiratory system, and other body systems and parts.

Material from the Navy Medical School's pathology department, the Army Institute of Pathology, Johns Hopkins Hospital and Georgetown University, facilitated the correlation of clinical histories and findings with related pathology and added "immeasurably" to the value of the book's presentations, the Navy said.

The third volume, which will be devoted entirely to oral and dental pathology, may be published before the second, which will deal with neuropathology and other specialties and will be completed in 1953 or 1954.

The work is published by J. B. Lippincott Company, Philadelphia.

ARMY DEFERS PERSONS WITH ORTHODONTIC APPLIANCES

Army officials have been notified by the office of the Adjutant General that applicants for enlistment and Selective Service registrants reporting for induction, and wearing orthodontic appliances, will not be considered physically qualified but will be deferred upon presenting a certificate from a qualified dentist showing the date the appliances were inserted and the approximate time treatment will be completed.

Association Affairs

RELIEF FUND CONTRIBUTIONS TABULATED TO NOVEMBER 30

By November 30, the end of the second accounting period in the American Dental Association Relief Fund Campaign, $39,144, or 39.1 per cent of the national quota, had been received from 13,639 of the nation's 86,000 dentists. North Dakota was in the lead with its quota already exceeded by 3 per cent. Individual contributions averaged $2.93 and ranged from $1 to $50. More than $200 was received from dental students.

By December 15, while tabulations for the third accounting period were not

complete, over 20,000 dentists had been heard from and contributions were coming at the rate of 600 daily.

In a statement December 15, Leo W. Kremer, chairman of the Relief Council, reemphasized the need for exceeding this year's $100,000 quota and stated that with the increased cost of living, applications for relief were increasing and could be expected to increase further. He urged all dentists to give generously.

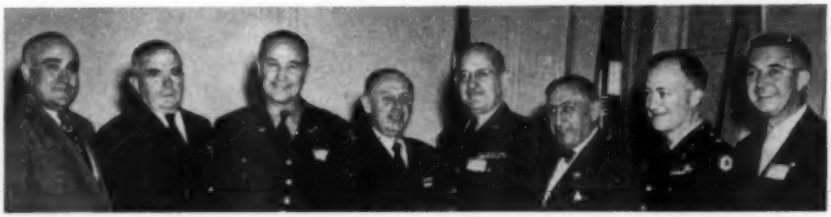
Quotas for the states, territories and armed forces are as follows:

Air Force, $480; Alaska, $40; Alabama, $780; Arizona, $280; Arkansas, $480; Army, $490; California, $3,670; Colorado, $890; Connecticut, $1,920; Delaware, $160; District of Columbia, $810; Florida, $1,200; Georgia, $990; Hawaii, $370; Idaho, $270; Illinois, $7,570; Indiana, $2,220; Iowa, $1,800; Kansas, $1,040; Kentucky, $1,070; Louisiana, $990; Maine, $460; Maryland, $1,040; Massachusetts, $3,720; Michigan, $3,830; Minnesota, $2,990; Mississippi, $530; Missouri, $2,620; Montana, $350; Navy, $880; Nebraska, $1,130; Nevada, $90; New Hampshire, $290; New Jersey, $4,220; New Mexico, $200; New York, $15,590; North Carolina, $1,220; North Dakota, $330; Ohio, $4,890; Oklahoma, $910; Oregon, $1,170; Panama C.Z., $30; Pennsylvania, $7,140; U.S. Public Health Service, $250; Puerto Rico, $270; Rhode Island, $530; South Carolina, $440; South Dakota, $350; Southern California, $4,420; Tennessee, $1,150; Texas, $3,100; Utah, $490; Vermont, $190; Veterans Administration, $1,040; Virginia, $1,150; Washington, $1,670; West Virginia, $740; Wisconsin, $2,890; Wyoming, $170.

ACCEPTED DENTAL REMEDIES 1951 EDITION AVAILABLE

Orders are being received in the Central Office for the 1951 edition of *Accepted Dental Remedies* now ready for distribution. The volume, which provides an up-to-date handbook of therapeutic agents in the dental field, represents a complete revision of the 1950 edition. Prepared by the Council on Dental Therapeutics under the direction of J. Roy Doty, secretary, it contains reports on all the products placed in the accepted (A) classification by the Council, and contains also a description of the present procedure for classification of products.

Copies of the 1951 edition may be purchased for $1.50 each from the Order Department, American Dental Association, 222 East Superior Street, Chicago 11.



Chiefs of federal dental services were guests at a luncheon in their honor at the ninety-first annual meeting of the Association in Atlantic City last year. Shown here are (l. to r.): Brig. Gen. Louis H. Renfrow, deputy director of Selective Service; Rear Admiral Alfred W. Chandler, assistant chief of the Bureau of Dentistry and chief of the dental division of the Bureau of Medicine and Surgery of the Navy; Maj. Gen. Walter D. Love, dental chief of the Army; Rear Admiral Spry O. Claytor, assistant dental chief of the Navy; Maj. Gen. George R. Kennebeck, dental chief of the Air Force; Bion R. East, assistant chief medical director in charge of dental service in the Veterans Administration; Brig. Gen. Oscar P. Snyder, director of dental activities at the Army Research and Graduate School, and Bruce D. Forsyth, chief of the dental division of U.S. Public Health Service.

Wilbur P. McNulty of Fort Wayne, Ind., president of the State Society Officers Conference, who was elected to this position at the annual meeting October 29 in Atlantic City. He succeeds Melvin E. Ralston of Pomona, Calif. Other officers elected for 1951 are George W. Matthews, Birmingham, Ala., vice-president; and Ralph R. Gibson, Denver, Colo., secretary.

B. D. MOEN MADE DIRECTOR OF BUREAU OF ECONOMIC RESEARCH

Appointment of B. Duane Moen as director of the Bureau of Economic Research and Statistics has been announced by Harold Hillenbrand, secretary of the Association. Mr. Moen, who has served as assistant director of the Bureau since May 1949, obtained his master's degree in statistics and educational psychology from the University of Minnesota and was a research and teaching assistant at that university before his appointment to the Central Office staff. Mr. Moen directed the *1950 Survey of the Dental Profession* and has been reporting it in a series of articles in THE JOURNAL since August of last year.

MISSION TO AID JAPANESE DENTISTRY IS POSTPONED

A mission to Japan by five A.D.A. officials, for the purpose of aiding the Japanese dental association to further dental progress in that country, has been postponed, probably until June. The mission was to have left the United States January 2. Invitation for the visit came from the Supreme Commander of the Allied Forces with Defense Department approval.

The 1950 edition of the American Dental Directory is now available. In addition to both geographical and alphabetical listings of all registered dentists in the United States and its territories, the new directory includes a geographical listing of dental specialists. Also included are dental schools, schools for training auxiliary personnel; state examining boards, their requirements and their secretaries; and comprehensive information concerning dentistry and national and state dental organizations, as well as national dental organizations in other countries.

This second edition of the directory will be kept up to date by quarterly supplements which may be stored in a pocket incorporated in the binding.

Copies of the Directory may be purchased from the Central Office for $12.50. Orders should be addressed to the Order Department, American Dental Association, 222 E. Superior Street, Chicago 11, Ill. Orders for the supplement service also should go to this address.

STAFF MEMBERS DESCRIBE LIBRARY AND INDEX SERVICES

An article in the *Journal of the American College of Dentists,* September 1950, by Josephine Hunt, associate librarian in the Central Office, traces the development and growth of libraries. In another article in the same issue, Martha Ann Mann outlines the history of the indexing of dental literature from the first index in 1886 to the present-day annual and quarterly cumulative publication, *Index to Dental Periodical Literature,* prepared by the Bureau of Library and Indexing Service of the American Dental Association. Miss Mann is the indexer of the Bureau.

Dental Societies

CLEVELAND SOCIETY SHOWS OPERATIONS IN COLOR TV

Color television was utilized by the Cleveland Dental Society at its meeting December 4. Hundreds of dentists watched the treatment of patients with carcinoma of the oral cavity by Clifford L. Kiehn, assistant professor of oral surgery at Western Reserve Dental School; and an osteotomy performed by Edward Teiter, chief of the department of oral surgery at Mt. Sinai Hospital Cleveland. Color gave both depth to the image and a wealth of detail not possible in black and white, it was reported.

The program, which originated in the surgery of the University Hospitals of Cleveland, was televised on a closed circuit to the Cleveland Public Auditorium, where it was viewed on 14 receivers.

1951 OFFICERS ELECTED BY SEVENTH-DAY ADVENTISTS

At the annual meeting of the National Association of Seventh-Day Adventist Dentists in Atlantic City October 27-28, 1950, the following officers were elected for the year 1951. Gerald A. Mitchell of Atlanta, president; Albert C. Koppel of Washington, D.C., vice-president; Albert E. Burns of Klamath Falls, Ore., secretary-treasurer; F. C. Nelson of Pomona, Calif., editor. Directors are W. Ross Stromberg of Orlando, Fla., C. C. Ray of Miami, Fla., W. T. Buchanan of Waynesboro, Va., Walter C. Dorn of Takoma Park, Md., and R. R. Steinman of Enka, N.C.

CHICAGO SOCIETY FILES SUIT AGAINST DENTAL LABORATORIES

In a novel legal action, 37 dental laboratories accused of advertising direct to the public in the *Classified Telephone Directory* were charged with violation of the Illinois Dental Practice Act in suits filed in October by the Chicago Dental Society. Hearings were to be held in December.

OHIO STATE TO GIVE WEEKLY AIRBRASIVE COURSES

A five-day course in airbrasive theory and technic will be presented weekly by the College of Dentistry of Ohio State University beginning January 8. Each class will be limited to ten dentists and will include practice as well as lectures and demonstration. Fee is $100 per dentist. The training is available also to dentists eligible for training under the G.I. Bill of Rights.

Application forms may be secured from the director of the postgraduate division, H. B. G. Robinson, College of Dentistry, Ohio State University, Columbus 10, Ohio.

The annual proclamation of Children's Dental Health Day on the first Monday of February of each year was proposed in legislation introduced into Congress in December by Rep. Thomas J. Lane (D., Mass.), Rep. Owen Brewster (R., Maine), and Sen. James E. Murray (D., Mont.) at the instigation of the Association. Third annual National Children's Dental Health Day will be observed February 5 in the most extensive program ever staged throughout the nation and its territories. Parent-teacher associations, social agencies, civic clubs, Boy and Girl Scouts, and hundreds of other groups will participate, as well as state and local health departments and medical and dental societies. In many areas the whole of that week will be proclaimed Dental Health Week, with radio broadcasts over national networks starting off the observances on Sunday, February 4.

Among programs planned for that day is a special Quiz Kids broadcast at 3:30 P.M., E.S.T. sponsored by the Cleveland Dental Society. An audience of 3,000 in the Cleveland Public Auditorium will watch while five dentists vie with the young geniuses in a test of knowledge of dental health as well as mathematics and mythology. Shown here are, at the back, Lonny Lunde and Joel Kupperman. Joel has been amazing audiences for nine years with his ability to compute involved algebraic problems in his head, even while playing the piano. In the center row are Brenda Liebling, Quizmaster Joe Kelly, and seven-year-old Harvey Dytch who knows all there is to know about all living creatures and dinosaurs. Pat Conlon, age 13, is in the center front. She is an expert on history, literature, current events, the Bible, and almost every other subject including dental and medical science.

ATOMIC ENERGY CONTEST FOR SENIOR STUDENTS ANNOUNCED

An award of $100 for the best essay on "Atomic Energy and Its Relation to Dentistry" by a senior dental student is offered by the First District Dental Society of New York. It is suggested that students wishing to enter the contest obtain a reprint of the August-September 1950 issue of the *New York Journal of Dentistry* which constitutes a primer on the subject of atomic energy in dentistry and contains a fairly complete bibliography.

Information may be obtained by writing to the chairman of the atomic energy program committee, Theodore Kaletsky, First District Dental Society, 9033 153rd Street, Jamaica 2, New York.

Dental Education

OREGON ANNOUNCES SERIES OF POSTGRADUATE COURSES

Two series of postgraduate courses are offered by the University of Oregon Dental School during the winter and spring of 1951. Winter courses, meeting one half day or one day each week, are: Mondays, January 8-March 12, a 70-hour course on complete dentures by S. C. Robinson of Portland; Tuesdays, January 9-March 13, a 70-hour course on oral surgery by S. A. Brandon of Portland; Wednesday mornings, January 10-March 14, a 35-hour course on caries control by Theodore Suher and Marshall Snyder of the Dental School; Thursdays, January 11-March 15, a 70-hour course on crown and bridge by John Kuratli of Portland. On Fridays, January 12-March 16, a 35-hour course on head and neck anatomy by Ellis B. Jump of the Dental School faculty will be presented in the mornings, and a 35-hour course on general anesthesia by Frederick P. Haugen of the Medical School faculty will be held in the afternoons.

During the spring term, the seven course program will be as follows: A 35-hour course on oral diagnosis and pathology by David Mitchell of the University of Minnesota, March 26-30; a 35-hour course on endodontics by W. J. Simon and J. R. Jensen of the University of Minnesota, April 2-6; a 35-hour course on gold inlays by H. I. Gilbert of Seattle, April 9-13; a 70-hour course on gold foil by Robert Hampson of Seattle, April 16-27; a 70-hour course on crown and bridge by John Kuratli of Portland, April 30-May 11; a 35-hour course on periodontics by Harold Ray of the University of California, May 14-18; and a 35-hour course on dental medicine by Hermann Becks of the University of California, May 21-25.

Except for the course on caries control, fee for which is $33, the fee for each 70-hour course is $108 and for each 35-hour course $54.

Details may be obtained by writing to Vinson M. Weber, head of the department of postgraduate education, University of Oregon Dental School, 809 N.E. Sixth Avenue, Portland 14, Ore.

TORONTO OFFERS CONTINUATION COURSES

Postgraduate courses for the remainder of the 1950-51 session are announced by the University of Toronto Faculty of Dentistry. A course in operative dentistry will be held February 19-23 with Carl Miller of Cleveland and Louis Schultz of Ann Arbor as guest clinicians. Enrollment is limited to ten.

A course in endodontics March 12-16 for the general practitioner will have as guest clinician J. H. Kaiser of Columbus, Ohio. Enrollment is limited to eight.

Dental roentgenology will be the subject of a course April 2-6 with James P. Coupland of Ottawa as guest clinician. Enrollment is limited to 12.

Courses for the remainder of the year are: orthodontics for the general practitioner, April 9-13; pedodontics, April 16-17; dental oral surgery and anesthesia, April 23-27; periodontics, April 30-May 4.

Tuition for each course is $75. Inquiries should be addressed to the dean of the faculty of dentistry, Roy G. Ellis, University of Toronto, 230 College St., Toronto, Ontario.

TENNESSEE REOPENS COURSE FOR DENTAL HYGIENISTS

Thirty young women are enrolled in the dental hygienists' training course which started at the University of Tennessee College of Dentistry in the fall of

1950, according to James T. Ginn, dean of the College. Graduates of the course, which covers six consecutive 11-week quarters, will receive certificates as "graduate dental hygienist."

A similar course was offered for 15 years before the war but was discontinued in 1942 because of lack of teaching personnel.

TEMPLE DENTAL SCHOOL OFFERS THREE POSTGRADUATE COURSES

Three postgraduate courses will be held early this year at Temple University School of Dentistry, Philadelphia, under the general direction of Louis Herman, professor of oral anatomy.

A course on mouth rehabilitation will be conducted by Louis A. Cohn of New York January 29-February 3. Periodontics will be the subject of a course by J. T. Rothner, professor of periodontics, to continue over seven successive Thursdays beginning February 22. Morton Amsterdam of the endodontics department will conduct a course on endodontics to continue through 12 successive Wednesdays beginning February 7. Courses are designed to combine both theory and practice, and registration is limited.

Details may be obtained by writing to the director of postgraduate and graduate courses, Temple University School of Dentistry, 3223 North Broad Street, Philadelphia 40.

COURSE FOR DENTAL ALUMNI AT NORTHWESTERN CENTENNIAL

Northwestern University Dental School will offer its alumni intensive four-day courses, including two days of scientific essays, practical clinics and technical exhibits, during the University's centennial celebration June 4-8, 1951, it is announced. In addition, a university conference of distinguished speakers representing the biological field will present a discussion of the problems of an aging population.

HOUGHTON NAMED DEAN AT LOYOLA, NEW ORLEANS

Frank J. Houghton of Jersey City, N.J., has been appointed dean of Loyola University School of Dentistry, New Orleans, effective January 15. He will succeed the Rev. Fr. William D. O'Leary, a physician, who has served as acting dean for the past two years. Father O'Leary will continue to serve on the board of directors and in his several other capacities at Loyola.

F. J. Houghton

Dr. Houghton, who obtained his dental degree from Baltimore College of Dental Surgery of the University of Maryland in 1917, has for the past thirty years been associated with the Jersey City Medical Center and since 1929 has been its dental director. In addition to instituting a dental internship and residency program at the Center, he has served as director of dental postgraduate studies and as supervisor of the department of oral hygiene. He has been a member of the Council on Dental Education of the American Dental Association and has served as president of the Hudson County Dental Society and president of the New Jersey State Dental Society.

EXTENSION COURSES BY TV AND TELEPHONE AT ILLINOIS

Dentists attending the Chicago Dental Society midwinter meeting may enroll in a two-day television course in occlusion in periodontal practice February 8-9. It will include presentations by Balint Orban of the Colorado Dental Foundation, Colorado Springs; J. P. Weinmann of the University of Illinois; Harry Sicher of Loyola University, Chicago; Bertram N. Downs of Colorado Springs, Colo.; Clyde H. Schuyler of New York; and John R. Thompson of Northwestern University, Chicago; and will be followed by a round table symposium and discussion by all of these clinicians moderated by Dr. Orban.

The course, fee for which is $25, is one of a series conducted by the postgraduate studies extension division of the University of Illinois College of Dentistry. Details and application forms may be obtained from the postgraduate studies extension division of the College of Dentistry of the University of Illinois, 808 South Wood St., Chicago 12, Ill. Veterans entitled to training under the G.I. Bill of Rights may present a certificate of eligibility in lieu of a fee.

Telephone courses designed for meetings of dental societies and clubs are being transmitted monthly by the University, to 46 states, the District of Columbia, and seven Canadian provinces.

ORAL SURGERY BOARD TO HOLD EXAMINATIONS IN APRIL

Examinations of the American Board of Oral Surgery will be held April 7-10 at the Blackstone Hotel, Chicago. Information may be obtained by writing to the secretary, Leslie M. FitzGerald, 718 Roshek Building, Dubuque, Iowa.

DENTAL EDUCATORS TO CONFER IN CHICAGO IN FEBRUARY

Dental educators from most of the nation's dental schools and examining boards will discuss methods for the evaluation of clinical and technical competence at the seventh annual Congress on Dental Education and Licensure at the Stevens Hotel, Chicago, February 3.

Anyone interested in problems of dental education or licensure is invited to attend, according to Shailer Peterson, secretary of the Council on Dental Education of the Association, which sponsors the Congress. Carl Frech, secretary of the Indiana State Board of Dental Examiners, is chairman of the local arrangements committee.

International

VENEZUELA DENTAL SCHOOL NEEDS TWO PROFESSORS

The three-year old school of Dentistry of the Universidad del Zulia, Maracaibo, Venezuela, is in need of two well qualified dentists with a knowledge of Spanish, for professorships on its faculty. One is to teach oral surgery; the other is to teach crown and bridgework and partial dentures. Appointments will be on a one-year contract basis with possible extension for a second year, and round trip passage to Maracaibo will be paid by the University. Salary is $500 a month.

Applications should be addressed to the dean, J. Araujo Belloso, Facultad de Odontologia, Universidad del Zulia, Maracaibo, Venezuela.

Many dentists from other countries attended the ninety-first annual session of the Association last October in Atlantic City. Among them were these distinguished neighbors from Canada, photographed as they chatted in the Traymore Hotel lobby. Left to right they are: Harry S. Thompson of Toronto; R. P. Lowery, president of the Canadian Dental Association; S. J. Phillips of Oshawa, Ont.; and Don W. Gullet, secretary of the Canadian Dental Association.

STILL TIME TO TAKE PART IN INTERNATIONAL CONGRESS

The program of scientific papers for the eleventh International Dental Congress to be held in London July 19-26, 1952, is now complete, according to information received. However, there is still opportunity for members wishing to present table demonstrations and scientific exhibits, and they are urged to apply as soon as possible to G. A. Morrant, Institute of Dental Surgery, Eastman Dental Hospital, Gray's Inn Road, London, W.C. 1.

Papers to be presented at the Congress will be published between September 1951 and June 1952 in the *International Dental Journal,* which made its first appearance September 1950. Transcripts of the discussions will be published in issues following the Congress. The journal, edited by H. H. Stones of Liverpool, England, may be obtained on subscription from British Publications, Inc., 150 E. 35th St., New York 16.

Legislation

U.S. MOVES TO SPEED CIVIL DEFENSE PROGRAM

Four civil defense bills (S 4217, S 4219, HR 9798 and HR 9841) were presented to Congress during the "Lame-Duck Session" just ended. All of them provide for establishment of a Federal Civil Defense Administration with power and authority to plan, review, and coordinate the civil defense activities of the Federal government, and to coordinate these activities with civil defense activities of the states, territories and possessions of the United States and neighboring countries. They provide also for appointment of a Federal civil defense administrator who will appoint a deputy administrator. Relief or aid for civilians in need or injured as a result of attack is provided for, with the Administration making grants to states on a 50-50 basis for civil defense purposes. A United States Civil Defense Corps also is provided.

President Truman on December 1 set up an *ad interim* Federal Civil Defense Administration to operate with emergency funds pending passage of legislation, and Millard F. Caldwell, Jr., of Florida, was appointed its director. Civil defense activities of National Security Resources Board were transferred to this organization.

One of the duties of the new Committee on Emergency Dental Services of the Association will be to work with the Civil Defense Administration.

FTC ORDER ON IPANA UPHELD BY U.S. COURT OF APPEALS

The U.S. Court of Appeals for the Fourth Circuit (Richmond) on November 13, 1950, affirmed the year old order of the Federal Trade Commission to the Bristol-Meyers Co. of New York, prohibiting misrepresentation in the sale of Ipana toothpaste.

Among advertising statements specifically mentioned in the "cease and desist" order were those to the effect that twice as many dentists personally use Ipana toothpaste as any other dentifrice, that more dentists recommend it to their patients than any other two dentifrices combined, that its use with massage prevents "pink toothbrush," that it has any significant value in the treatment of oral, dental or gingival disease, that modern diets do not give proper stimulation to the gingiva or that such diets make the gums susceptible to trouble, and that massage with the toothpaste stimulates circulation, imparts firmness or health to the gums, or prevents gingival disorders.

The "Complaint, Findings and Order" of the F.T.C. in this matter occupied 17 pages in the *Federal Trade Commission Decisions* published in November 1949.

Public Health

HEALTH COUNCIL BOARD TO MEET THIS MONTH

The National Health Council has scheduled a meeting of its board of directors January 12 in New York. The Council, an association of 31 leading national health agencies and professional societies, is concerned with the improvement of public health throughout the country and with the coordination of the programs of its member agencies. Harold Hillenbrand, secretary of the Association, and Allen O. Gruebbel, secretary of the Council on Dental Health, are members of the board of directors. Delegates from the Association are William McGill Burns, Second District trustee; LeRoy M. Ennis, president-elect; and Daniel F. Lynch, Fourth District trustee.

PUBLIC HEALTH ASSOCIATION ELECTS NEW DENTAL OFFICERS

At the meeting of the American Public Health Association in October in St. Louis, the following officers of the dental health section were elected: David M. Ast of Albany, N.Y., chairman; Thomas W. Clune of Providence, R.I., vice-chairman; Thomas L. Hagan of Washington, D.C., secretary. Dr. Ast is director of the bureau of dental health of New York State Department of Health; Dr. Clune is public health dentist in the Division of maternal and child health of the Rhode Island Department of Health; and Dr. Hagan is assistant chief of the division of dental public health, U.S. Public Health Service.

THREE DENTAL SCHOOLS GET USPHS RESEARCH GRANTS

Recently announced U.S. Public Health Service grants for the support of dental research projects include two to the University of Illinois College of Dentistry. M. S. Burstone, assistant professor of oral pathology, receives $6,620 for a study of oral neoplastic changes induced by radioactive materials, and Bernard G. Sarnat, professor of oral and maxillofacial surgery at the College of Dentistry, receives $3,456 for a one-year study on facial growth.

A grant of $2,970 has been made to Paul H. Keyes, associate in clinical dentistry at Harvard School of Dental Medicine, for a study to determine a chemical

diet most conducive to caries development in hamsters.

Raymond L. Hayes, professor of oral surgery at Howard University College of Dentistry, Washington, D.C., has received a grant of $6,750 for an investigation concerning ascorbic acid metabolism in relation to periodontal disease.

USPHS CHIEF APPROVES WATER SUPPLY FLUORIDATION

The addition of sodium fluoride to public water supply will substantially reduce dental decay in children, and the reduction is greatest when fluoride is used continuously from birth, according to an announcement by Surgeon General Leonard A. Scheele of the Public Health Service.

Dr. Scheele based his statement on the preliminary report of a study conducted jointly by the Public Health Service, the Michigan State Health Department and the University of Michigan. The report, by H. Trendley Dean and hs co-workers, appeared in the October 27 issue of *Public Health Reports.*

According to Dr. Scheele, in addition to studies by state and local health departments throughout the country, by October 1950 addition of sodium fluoride to the water supply was routine practice in 36 municipalities.

The American Dental Association recommended the fluoridation of community water supplies at its annual meeting last October with the qualification that the procedure must be "approved by the local dental society and utilized in accordance with the standards established by the responsible health authority." The State and Territorial Dental Health Directors adopted a similar resolution last June.

Research

McKAY RECEIVES AWARD FOR STUDIES ON MOTTLED ENAMEL

Frederick S. McKay of Colorado Springs, Colo., has received an award from the American Association of Public Health Dentists in recognition of studies on mottled enamel which he has carried out continuously since 1908. According to Carl L. Sebelius, secretary of the A.A.P.H.D., Dr. McKay's studies "demonstrated the fluorine dental health relationship for the universal and perpetual benefit to all mankind." This is the first award to be made by the organization, he states.

A.M.A. DONATES HALF MILLION TO NATION'S MEDICAL SCHOOLS

The American Medical Association has contributed $500,000 for aid to medical schools. The sum, appropriated by the board of trustees at its December meeting in Cleveland will form the nucleus of a fund to be raised for aid to medical education throughout the nation, it is reported. According to Louis H. Bauer, chairman of the A.M.A. board of trustees, the sum was appropriated from the organization's national education campaign fund, which was raised "to defend medical freedom. . . ."

RESEARCH GRANTS RECEIVED BY PITTSBURGH DENTAL SCHOOL

Two research grants totaling $10,500 have recently been received by the University of Pittsburgh School of Dentistry for investigations to be conducted under the direction of Gerald J. Cox, professor of dental research.

A grant of $7,500 from Johnson and Johnson, New Brunswick, N.J., is for the study of methods of removal of stains from teeth to be conducted by S. Wah Leung. A grant of $3,000 from the Dental Research Associates of Pittsburgh, is for a study to evaluate the use of a hydrophylized preparation of iodine in oral surgery to be conducted by Charles J. Ganley, a graduate student.

COLLEGE OF DENTISTS OFFERS RESEARCHERS TRAVEL FUND

Two funds to aid researchers have been set up by the American College of Dentists. The William J. Gies Research Fund will provide travel and per diem expenses for an investigator wishing to consult with another worker in his field. A second fund will provide assistance in emergencies such as laboratory accidents which threaten termination of a study in progress.

Applications for grants from either of these funds should be sent to Philip Jay, chairman of the committee on research of the American College of Dentists, School of Dentistry, University of Michigan, Ann Arbor, Mich.

NORTHWESTERN AWARDED TWO RESEARCH GRANTS

Two separate grants for the support of dental research at Northwestern University Dental School have been announced. A grant of $1,500 from Smith, Kline and French Laboratories, Philadelphia, is for research on new dental anesthetics to be directed by Stanley C. Harris, chairman of the department of physiology and pharmacology. Grants made by this company to Northwestern for medical and dental research total $66,745 since 1942.

A $5,000 grant from the New York Community Trust is for a study of "dental permeability" directed by L. S. Fosdick, professor of chemistry in the Dental School.

General

B. G. SARNAT RECEIVES PRIZE FOR PLASTIC SURGERY ESSAY

A paper by Bernard G. Sarnat, on the effect on the growing mandible of the *Macaca rhesus* monkey of experimental removal of the condyle, received second prize in the 1950 international essay competition for the Kerbs award in plastic surgery. Dr. Sarnat is professor of oral and maxillofacial surgery at the University of Illinois College of Dentistry. First prize went to David M. Ju of Columbia Presbyterian Medical Center in New York, for his essay on the physical basis of scar contraction.

The Kerbs award is offered by the Foundation of the American Society of Plastic and Reconstructive Surgery for an essay on an original unpublished piece of basic or clinical research in plastic surgery. Dr. Sarnat presented his paper at the meeting of this society held jointly with plastic surgeons of Central and South America November 29 in Mexico, D.F.

FOOD AND DRUG REGULATIONS ALTERED FOR DRUGGISTS

At the instigation of the American Pharmaceutical Association, the Food and Drug Administration of the Federal Security Agency is formulating new regulations concerning the refilling of pre-

scriptions. A proposed rule was published in the *Federal Register* of December 6, 1950, and interested persons were invited to submit comments within thirty days of that date.

Although old regulations were interpreted to mean that a filled prescription had the finality of a cancelled check, druggists have objected to that interpretation. New regulations are expected to permit refilling of prescriptions which contain items eligible for over-the-counter sale.

MENDEL NEVIN DIES

The death is announced of Mendel Nevin of New York, from a heart attack November 10. Dr. Nevin, who obtained his dental degree from the New York College of Dentistry in 1907, engaged in the active practice of dentistry as an oral surgeon and became well known for his work on anesthesia. He was president of the Novocol Chemical Manufacturing Company, Inc., which he founded in 1911, and was the editor of several textbooks on his subject. He was owner and general manager of *Dental Items of Interest*, and editor of *Modern Dentistry*. He was a past president of the Kings County Dental Society and active in many professional and charitable organizations, local and national.

W. CLYDE DAVIS DIES AFTER HALF CENTURY IN DENTISTRY

W. Clyde Davis of Lincoln, Neb., founder and first dean and professor of oral surgery of the University of Nebraska College of Dentistry, died October 11. A native of Byron, Ill., Dr. Davis received his dental degree from the University of Iowa, and master's and doctor's degrees from the University of Nebraska and Cotner College respectively. He was in active practice from 1898 until his retirement in 1949 and became well known for his research in pulp canal therapy, and also for his textbook on operative dentistry. He was a past president of the Nebraska Dental Society, and the first president of the Lincoln Odontographic Society which later became the Lincoln Dental Society.

EARL E. GRAHAM DIES

Earl E. Graham, former secretary of the Relief Commission of the Association, died at Colorado Springs, Colo., December 9. Prior to moving to Colorado in 1944, he practiced for almost thirty years in the Chicago area. Dr. Graham was born in 1894 in Kinmundy, Ill. He attended Valparaiso University and was graduated from the Chicago College of Dental Surgery, now the School of Dentistry, Loyola University. He served in World War I, and was a member of the Elmhurst, Ill., school board and a trustee of the National College of Education, Evanston, Ill. He is survived by his widow, a son who is a Navy physician, and a daughter.

CIVIL SERVICE INTERNSHIP EXAMINATION ANNOUNCED

Dental intern appointments beginning July 1, 1951, are available at St. Elizabeth's Hospital, Washington, D.C. Applicants must be fourth-year students in an approved dental school.

Information may be obtained on application to the committee of U. S. Civil Service Examiners, St. Elizabeth's Hospital, Washington, D.C.

DENTAL ANESTHESIA ACADEMY TO HOLD MARCH MEETING

The American Society for the Advancement of General Anesthesia in Dentistry will hold its spring meeting March 26 in New York at the Shelburne Hotel. Members of the profession are invited to attend the scientific session, which be-

gins at 8:30 P.M. On the program are a discussion of intratracheal anesthesia in the treatment of spastic, demented and difficult children, illustrated by motion pictures, by E. Reed Smith of Washington, D.C.; a paper on anesthesia for acute abscesses in the head and neck, by J. Eugene Ruben of Philadelphia; and a presentation on the prevention of complications during anesthesia for oral surgery, by Leonard M. Monheim of Pittsburgh.

Details may be obtained by writing to the executive secretary, M. Hillel Feldman, 730 Fifth Avenue, New York.

PACIFIC COAST CONFERENCE MEETS IN SEATTLE IN JUNE

Plans are well under way for the eighth Pacific Coast Dental Conference to be held in Seattle June 25-28, according to Frank E. Wood, president. Harold W. Oppice, president of the Association, will address the Conference, and a full program of scientific sessions, clinics, and recreation is being planned. The 11 components of the Conference comprise 8,000 members from U.S.A. and Canada.

Late News

DRAFT LAW AMENDMENTS TO BE CONSIDERED

Maj. Gen. Lewis B. Hershey, director of the Selective Service System, reporting to his six scientific advisory committees in Washington, D. C., December 18, urged that Congress study draft law amendments before the end of January. Blanket deferment now given college students, the General said, conflicts with present needs of the Armed Forces. In light of General Hershey's statement the Committee on National Emergency Dental Service of the Association will meet in early January to consider suggested proposals to amend the draft act and also proposals to establish universal military service in order to insure a continuous flow of dental students for military and civilian use.

Members of the Committee on National Emergency Dental Service are Harold W. Oppice and Harold Hillenbrand, president and secretary, respectively, of the Association; Henry M. Willits, chairman Council on Dental Education; R. H. Friedrich, chairman Council on Federal Dental Service; E. Harold Gale, chairman Council on Legislation, and Francis J. Garvey, executive secretary.

COOPER COMMITTEE TO BE DISCONTINUED

At press time it was reported that the Medical Advisory Committee to the Secretary of Defense is to be discontinued and that all members have tendered their resignations. This committee, frequently designated the Cooper Committee, was composed of civilian members who advised the Secretary of Defense on medical, dental, nursing and hospital defense problems. Presumably the Cooper Committee is to be replaced by a smaller committee composed of the Surgeons General of the Army, Navy and Air Force; a group of laymen, and Richard L. Meiling, director of medical services for the Defense Department.

LYONS APPOINTED DENTAL DEAN MEDICAL COLLEGE OF VIRGINIA

Harry Lyons has been appointed dean of the School of Dentistry, Medical College of Virginia, replacing the late Harry Bear. Dr. Lyons retires from private practice and assumes his new duties on January 1.

International Correspondence

NEWS FROM GREAT BRITAIN

The Royal College of Surgeons of Edinburgh has recently received donations of interest to dentists, especially to those interested in the history of the profession. The late William Guy bequeathed a fine sculptured head of his father-in-law, the late John Smith. Menzies Campbell of Glasgow presented some old dental books of interest and in addition three fine examples of penmanship executed by Dr. Smith while he was a senior schoolboy. In these scrolls one sees the manual dexterity that in later years was to make Dr. Smith the most renowned dentist of his generation. He was encouraged to give lectures in the anatomy and physiology of the teeth in 1856, and shortly afterwards he was instrumental in founding the Edinburgh Dental Dispensary which, after modest beginnings, fluorished and became the Edinburgh Dental Hospital and School of which Dr. Guy was for so long the honored dean. The first lectures in dentistry in Britain were given in the hall of the Incorporation of Surgeons of Edinburgh in 1764 by James Rae, the father of William Rae who first lectured on dentistry in London in the house of John Hunter.

NEW DENTAL MAGAZINES

Two new dental periodicals have made their first appearance this autumn. After so many disappointments and postponements, the Fédération Dentaire Internationale members welcome the appearance of their official publication, *The International Dental Journal*. The first number has been very well received in this country. H. H. Stones of Liverpool is the editor-in-chief, and we know that the journal will be of a very high standard as all his work is hallmarked by accuracy and care. This magazine will be issued quarterly.

A new monthly publication, *The Dental Practitioner*, appeared in September. It is published by John Wright & Sons, Ltd., of Bristol. The editor, John Sear, and his two associates, H. Mandiwall and N. Livingstone Ward, state that the publication "is primarily a journal for those engaged in the practice of dentistry." They say that the aim is "to publish helpful matter in an interesting and pleasing manner, to make use of the pictorial form of presentation whenever possible, and to be informative and topical without being dull."

The last issue of the *British Dental Journal* is very slim because of the recent printers' strike. The strike has now terminated and a return to the former size of the dental journal is hoped for. However there is a likelihood of paper restrictions coming into greater prominence again and our newspapers and journals may return to their former wartime small size.

THE ORAL SURGERY CLUB

The Oral Surgery Club was recently the guest of the Army at a two-day meeting. The first day was occupied with operating sessions at the Westminster Hospital and at the Queen Alexandra Military Hospital. A wide range of surgical operations was offered including the removal of third molars, the fascial sling operation to strengthen the capsule of the temporomandibular joint, the removal of submaxillary calculi, the Caldwell-Luc operation, and the removal of a palatal tumor. The following day, at the Royal Army Medical College, Maj. Gen. F.R.H. Mollom, C.B., C.B.E., M.C., the commandant and director of studies, welcomed the Club and told the members something of the history of the College and of the important research carried out since its foundation.

A most interesting paper was read by Lt. Col. Hargreaves on antibiotics. Because of the dollar shortage, the newer antibiotics are not widely available and only recently have aureomycin and chloromycin become more readily obtainable in hospital practice. Col. S. H. Woods gave a most interesting historical paper and read original descriptions of osteomyelitis of the jaw and of the first recorded cooperation of a surgeon and a dentist in the time of Charles II (1660-1685). Miss Howard of the British Red Cross Society told of the work being done in the welfare service in military hospitals. Colonel Drummond dealt with malignant disease of the maxillary sinus and described with models his treatment by fenestration of the palate and trans-oral removal of the superior maxilla. The afternoon was spent at a demonstration of clinical cases.

Book Reviews

ENDODONTIA

By Bernhard Gottlieb, M.D., D.M.D., LL.D., Seth Lee Barron, D.D.S., and J. Hobson Crook, D.D.S. 177 pages with 103 illustrations. Index. Price $6.00. St. Louis: C. V. Mosby Company, 1950.

The contents of this attractively bound volume are divided into 42 topic headings. Distributed among its pages are 63 photomicrographs, besides roentgenographic reproductions and a few drawings. An index and bibliography are also included.

In this work the co-authors made an effort to summarize the knowledge they have acquired from their investigations and clinical experiences. Their estimation of the importance of their contribution to the knowledge of endodontic procedures may be gathered from the preface. In their opinion, the technics evolved as a result of their investigations are the final approach to the problem of the pulpless tooth. A significant fact in connection with the research work reported in this book is that in the main it was limited to dogs. It is interesting that the authors take for granted that all their findings coincide with what basically may be expected in human beings. Does not such a probability raise a very questionable issue?

The book is written in a decidedly unpedantic manner. It lacks clarity and conciseness, and is replete with repetition. It lacks an adequate bibliography. Instead of a reference addendum at the conclusion of each topic heading, the complete bibliography appears at the end of the book.

The outstanding feature of this book is the photomicrography. The roentgenography in most instances unfortunately leaves much to be desired.

The contents of a book of this character will naturally be subjected to much criticism. The authors have not sufficiently conveyed the technical procedures as developed. It contains suggestions which are diametrically opposed to the present day knowledge of the subject, and practically discredits all approved endodontic procedures. This reviewer can take serious exception to many statements, and is also in disagreement with most of the prescribed technics. Many of these technics are antiquated and impractical, and do not fulfil the every day needs of a rational endodontic procedure.

The book may be of some interest to one who wishes to acquaint himself with the Gottlieb method of endodontic treatment. Its contents, however, are too disassociated, confusing and incomplete in description to be of practical usefulness as a textbook for the dental student, to whom instruction must be more extensive and more definite.

We all recognize that science accepts no man's word as final. Nevertheless, the name of Bernhard Gottlieb is deserving of much praise and credit for his many contributions to dentistry.

E. Alan Lieban

OLD AGE: SOME PRACTICAL POINTS IN GERIATRICS AND GERONTOLOGY

By Trevor H. Howell, M.R.C.P. Second edition. 108 pages. Illustrations. Price 10s. 6d. London: H. K. Lewis & Co., Ltd., 1950.

Much practical and interesting information is provided in this small volume, which is an extensive revision of the book published originally in 1944. The author's findings are the result of careful studies carried out among groups of elderly patients, and this fact adds to their reliability. In addition to chapters on organic changes in the various body systems, there are special considerations that add to general understanding of the subject. Among these may be mentioned the opening chapter, "Approach to Old Age," in which the author presents a panoramic survey of the many considerations involved. Other good discussions are contained in chapters on disease in old age, assessment of physical signs in the elderly, and the final chapter, "The A.B.C. of Geriatrics," in which the author reminds us that it is more a state of mind than a branch of medicine or a mode of treatment.

Numerous tables and charts are provided to emphasize the discussion. Interesting comment on the teeth in old age includes the statement that dyspepsia is commoner in the edentulous than in those whose oral state is foul, and that removal of infected teeth in old people is far from a panacea.

The book is a stimulating contribution in a field that is commanding more attention constantly.

W. W. Bolton

ACRYLIC INLAYS, CROWNS AND BRIDGES

By Irwin Robert Levy, D.D.S. First edition, 124 pages with 151 illustrations. Index. Price $3.75. Philadelphia: Lea and Febiger, 1950

The book is divided into an introduction and four chapters which discuss inlays, crowns, bridgework and processing and color. The introduction gives a brief history of plastics, from the billiard ball to present day materials now being used for dentistry. Most of this information is taken from the *Handbook of Plastics* by Simonds and Ellis, which is one of the really comprehensive books on plastics.

The discussion of color in relation to teeth is good, as are his directions for thimble, dowel and veneer crowns, and for repairs of broken and lost facings. The balance of the book is composed of material which has been demonstrated in clinics and is unfortunately a little late reaching print in the face of the tremendous advances being made in the application of plastics for dental use.

By far the greatest portion of the book is given over to the preparation of cavities, wax patterns, hydrocolloid and Dietrich impressions, copper plated and amalgam dies and models. Very little space is devoted to the actual preparation, handling and processing of the acrylics themselves.

The author is to be congratulated on his suggested precautions as to the types of restorations for which the acrylics may be safely used, as well as his correct and detailed pattern making. The material is easy to follow and his illustrations are good. Some of the illustrations have been used in other works and proper credit is given in each case.

LaMar W. Harris

THE ACRYLIC PLASTICS IN DENTISTRY

By Jacob R. Schwartz, D.D.S. First edition. 379 pages with 364 illustrations, 8 in color. 50 page glossary. Index. Brooklyn: Dental Items of Interest Publishing Co., Inc., 1950.

The book is composed of 15 chapters, 8 of which are devoted to plastics themselves, the balance to their dental use. Simonds and Ellis are one of the sources of much of the information in the first portion of the book, which is very comprehensive. Considerable research obviously has been done on the history of the plastics and their development.

The illustrations in the first portion of the book will be of interest to those who have not had an opportunity to see and study any of the industrial uses of plastics.

The processing of full dentures is outlined, with fine illustrations to show the proper technic. Construction of both full acrylic crowns and those with metal inserts are described and illustrated, as well as abutment pieces and supporting framework. Staining and characterization technic is fully outlined in both word and picture.

Brief mention is made of the use of the acrylic materials in the making of artificial eyes utilized during World War II when the normal source of artificial eyes was cut off. Contact lenses are also mentioned.

Fifty pages are devoted to practical cases. Included also, is a chapter taken from *Modern Methods of Tooth Replacement* which was written by Schwartz 10 years ago. This chapter gives a detailed account of denture materials from the year 1750.

Credits are profusely given and offer an extensive index to further study on the subject. The glossary is well prepared and should be of great help to any student of plastics.

LaMar W. Harris

WESEN UND BEDEUTUNG DER ZAHNMEDIZIN (THE BASIS AND IMPORTANCE OF DENTAL MEDICINE)

By Professor Max Spreng, M. D. Odonto-Stomatologie, Vol. II Supplement I. 35 pages. Price in Swiss francs 3. Basel, Switzerland: Birkhauser, 1950.

This treatise on the problem of dental medicine was delivered by Max Spreng, director of the Dental School, University of Basel, at the opening of festivities of the 25th anniversary of the establishment of the Dental School in Basel.

Spreng gives a historic review of the development of dentistry and especially of the importance of dentistry in health service, and its place as an integral part of medicine. He mentions the establishment of the first dental school in Baltimore in 1839, and the first state dental school in Europe in Geneva in 1881. He pays tribute to the accomplishments of Horace Wells and William Morton. He discusses the developing tendency toward prevention. He stresses the importance of the biologic basis of all dental activities, operative, surgical and prosthetic.

It gives Spreng great satisfaction that the dental school is considered an integral part of the medical school. He stresses the importance of purely scientific investigations without the necessity of immediate clinical application. Only with long-range programs in education and first-class clinical instruction, can the patient be served as a human being.

Balint Orban

THE STRATEGY OF HANDLING CHILDREN

By Donald A. Laird, Sc.D., and Eleanor C. Laird, Research Librarian. First edition. 276 pages. Price $3.85. New York: Funk & Wagnalls Company, 1949.

This popular edition of everyday problems of children is presented in question and answer form. The questions arose out of a series of lectures given by the authors and the answers were formulated for this textbook. The subject material is divided into several chapters, one devoted to prenatal problems, another to growth and development, and a third to individual effectiveness. The authors give a timetable of growth and development at yearly intervals without any explanation of the normal variations that occur in individual children. The developmental achievements of a child observed by Gesell and his associates deviate considerably from the so-called norm or average. Parents take such tables literally unless such explanation is given. They may even attempt to force the child into the mediocre mean without the realization that these body variations in form and function arise from internal forces of growth. It takes a harmonious integration of motivating elements to create the individual timetable of growth and development. There is a series of interesting questions of heredity clearly answered for the curious parent. The authors stress wisely that children come through parents rather than from them. The emotional problems of early infancy are given less consideration than those of later childhood. This is unfortunate because the entire personality structure is founded upon adequate emotional relationships ingrained in the early years of life. The authors tend to give general bits of wisdom in short, crisp sentences. Unfortunately, such general advice has multiple meanings. Each parent interprets such generalizations in his own way, hence such advice often defeats its purpose. Some of the advice on mouth care is not in accord with current concepts. For example, gumchewing, thumbsucking and toothpicks are condoned. Formidable advice is given on development of personality, personal hygiene, hygienic care, improvement of the senses, perfection of learning power, development of courage, and formation of good habits. Each discussion is illustrated by personal instances in the lives of great men and women during childlhood.

The book is a fine collection of authentic answers to many of the questions asked by parents. The questions are always the same by parents of each generation but the answers differ in each era. The questions in this book are answered by psychologists from this standpoint. Obviously, solutions to children's problems are as much physical, mental and social as they are mental and psychologic. There is a tendency for some of the answers to be one-sided in consonance with the current psychological era.

I. Newton Kugelmass

THE MIRACLE DRUGS

By Boris Sokoloff, M.D. 308 pages with 20 illustrations. Index, bibliography and notes. Price $3.00. Chicago and New York: Ziff-Davis Publishing Company, 1949.

This popularly-written and comprehensive discussion covers the sulfonamides, the antibiotics, the arsenicals and proflavin. The historical and evolutionary research background provided in most instances adds to the interest and value of the book.

The book is obviously not intended as a text or therapeutic manual, and should not be used for those purposes. It does give, in highly readable form, a panoramic view of the chemotherapeutic drugs which are of such great current interest.

STANDARDS AND LABELS FOR CONSUMERS' GOODS

By Jessie V. Coles. 564 pages. Index. Price $5.00. New York: The Ronald Press, 1949.

The most outstanding characteristics of this clearly written book are its comprehensiveness and the care the author has taken to assure accuracy in the highly technical text. Typical sections are "Some Basic Concepts of Standards," "How We Use Standards," and "Grade Labeling of Consumers' Goods."

As the title indicates, the book covers a narrow, but important phase of practical consumer economics. The work of the Council on Dental Therapeutics of the American Dental Association and a large number of other agencies which establish standards for consumer goods is described and discussed with interesting and appropriate specific examples.

"Standards and Labels for Consumers' Goods" should be useful primarily as a text for courses in consumer problems, marketing and home economics. However, anyone who sincerely desires to know more about standards and labels and is willing to devote enough time to perusal of the book, will find his efforts well repaid.

Donald A. Wallace

TEXTBOOK OF PHYSIOLOGY

By William D. Zoethout, Ph.D., and W. W. Tuttle, Ph.D. Tenth edition. 710 pages with 301 illustrations, 6 in color. Index. Price $4.75. St. Louis: C. V. Mosby Company, 1949.

The tenth edition of this well known text has undergone considerable revision and has some useful additions. In some of these, such as the radioactive isotopes and the Cori cycle, one could have wished for a more complete discussion. This text is designed to fill the gap between the introductory type of treatment and the more exhaustive treatises. This aim has been achieved. The material has been well organized and lucidly written and the basic phenomena, the essential anatomy, and the chief practical applications are listed and clearly explained. However, to this reviewer, at least, the material is often too brief or too simplified to meet the needs of a good course in dental physiology.

One may sympathize with the authors' adherence to a policy of omitting the great amount of reference material contained in some of the larger treatises and in not using the names of the discoverers of the various reflexes and physiologic effects. On the other hand, a certain elegance and completeness is lost from physiology when this background material is eliminated. In the present edition, a newly added brief description of the pneumotoxic center as a rhythm-regulating center is adequate but some mention of the series of beautiful experiments leading up to this concept would add greatly to the students' interest in this important part of respiratory control.

The first five chapters, devoted to a brief but clear exposition of basic physico-chemical properties of living systems, should be valuable to students who have not had adequate training in chemistry and biology. Following sections on nerve and muscle physiology are well treated and profusely illustrated. This section should be particularly valuable in relation to laboratory experiments in this field of physiology.

The normal physiology of the cardiovascular system receives unusually good treatment for a text of this size. For dental students, however, more of the usual abnormalities in function should be included in preparation for pathology. More of the physiologic changes associated with the shock state might be described.

The essential principles of respiration and digestion are logically explained. In the section on renal activity, more explanation of hormonal influences and threshold substances would be of value.

Central nervous function and special senses are satisfactory for dental needs. The twenty-three pages devoted to hormones, exclusive of reproductive function, are too brief. This edition shares a common lack with most of the physiology texts in not attempting a better integration of humoral function with homeostasis and nutrition.

Just where the line of instruction in physiology should be drawn is debatable but the advancing physiologic needs of dentistry, although less than those of some fields of medicine, seem to require a fairly extensive treatment, especially in digestion, nutrition, respiration and in nerve and muscle function. This text is excellent in some of these categories but for dental physiology some amplification would be desirable, especially in the treatment of hormones. The authors are to be complimented on the care, clarity and accuracy of presentation of the material.

R. H. Oster

BONES AND JOINT RADIOLOGY

By Emerik Markovits, M.D. First edition. 446 pages, with 616 illustrations. Price $20.00. Bibliography and Index. New York: The Macmillan Company, 1949.

Bones and Joint Radiology can be recommended to the dental profession, not from the viewpoint that it contains any dental information pertaining to the roentgenographic interpretation of diseases of the teeth, but for the general information given in reference to the anatomy and physiology of bone and the ossification and growth of the skeleton. Chapter 21 is devoted strictly to a discussion of the skull from the viewpoint of the radiologist; here are some 50 pages of information which can be highly recommended for reading and study. For many years the temporomandibular articulation has been the subject of general discussion by both the medical and dental professions, much of which showed a lack of understanding of the anatomy and more especially the growth and development of joints. While the author does not specifically discuss this region in detail, he does discuss inflammatory diseases, benign and malignant tumors and abnormalities of bones and joints in such a manner that the student or reader is soon aware that a vast amount of authentic information has been digested for him and is his for the reading. *Bone and Joint Radiology*, while not strictly a dental book, can be highly recommended to the profession as one containing a vast amount of usable information.

LeRoy M. Ennis

TERAPEUTICA ANTIBIOTICA CON TIROTRICINA. (ANTIBIOTIC THERAPEUTICS WITH TYROTHRICIN)

Publication of the Department of Scientific Research of the Instituto Massone, S.A. 76 pages. Buenos Aires, 1949.

This booklet prepared by the Science Department of the Instituto Massone, chemical manufacturers and distributors of Buenos Aires, presents a résumé of data so far published on the use of tyrothricin as a therapeutic agent. Clinical work done in Argentina, Brazil, Costa Rica, the United States, France, England, Italy and Madagascar is included.

It is pointed out in the introduction to this volume that this antibiotic substance about which information was first published in 1939 by its discoverer René Dubos, of the Rockefeller Institute, New York, has proved singularly successful in the field of materia medica. Evidence of its efficacy is found in the continued and increased use of this agent despite the availability of penicillin and the sulfa drugs. Experiments have proved it to be completely harmless when applied locally to skin and mucous membranes even in considerably higher concentrations than necessary for therapeutic purposes. Its hemolytic qualities, however, contraindicate its use by injection. It is explained that in all cases herein reported a solution of tyrothricin in alcohol, to be diluted at time of use, was employed, and that a more stable preparation with a dispersing agent as base might be expected to give even better results.

Case reports are given in the following general categories: digestive tract, respiratory tract; surgery; dermatology—with special report on the treatment of ulcers of leprosy; epidemiology; gynecology; urology and ophthalmology.

In the latter section, warning is given of chemical meningitis caused by penetration of the antibiotic into the subarachnoid space following radical surgical intervention in cases of sinusitis. Use of tyrothricin should be avoided where there is suspicion of opening in the dura mater; routine and indiscriminate use of the substance to irrigate cavities near the subarachnoid space should not be practiced.

Cases in which tyrothricin has been employed in oral surgery and pathology are reviewed in the final section of the book. An introductory paragraph outlines the technics and results of research on the use of this substance in dentistry, concluding: "On the basis of these studies use of tyrothricin is entirely justified in prevention and treatment of dental and oral diseases. Such use has been substantiated by the work of numerous writers (Smith, 1944; Fechtner, 1944; Johnson, 1943; Kolmer, 1948). Kolmer advises the local use of tyrothricin in the following: apical granulomas, dry socket, gingivitis, periodontal diseases, post-extraction infection, pulpitis and stomatitis."

There is a bibliography of 80 entries from medical and dental world literature, and a classified table of contents.

Martha Ann Mann

FOR THE DISABLED SICK —DISABILITY COMPENSATION

By Nathan Sinai, Dr. P. H. 126 pages. Appendix. Price $1.00. Ann Arbor: University of Michigan, 1949.

In this book the author portrays protection against wage loss not associated with employment as an evolution in the industrial revolution that has taken place during the last two centuries. The great majority of people, he states, made a living in the past, whereas today they earn a living. To protect the ability to earn a living, society has developed a variety of plans, three of which he describes. They are disability compensation plans in Rhode Island, California and New Jersey. He lists the more common economic hazards as: unemployment, illness or injury arising from employment, illness or injury not associated with employment, inadequate economic preparation for old age, and the costs of medical and hospital care.

The second and third chapters describe the history and administration of the law in Rhode Island and California. Rhode Island has a compulsory cash sickness compensation act, while California has a compulsory illness disability act which permits a voluntary choice of carrier.

The author also describes the legislative and disability compensation act in the State of New Jersey and the difficulties in the medical and general administration of all three plans.

The author is of the opinion that the adoption of a disability compensation act is the next trend in the realm of socioeconomic planning. The three plans outlined in this study are varied and should be carefully watched. All of them have medical implications, but eventually they may affect the practice of dentistry.

The book is recommended for the practitioner and should be on the shelf of everyone interested in socioeconomics and trends in health insurance.

Harry Strusser

A TEXTBOOK OF BACTERIOLOGY FOR DENTAL STUDENTS

By Arthur Bulleid, L.R.C.P., M.R.C.S., F.D.S., and C. W. Shuttleworth, L.R.C.P., M.R.C.S., F.D.S. Third edition. 247 pages with 64 illustrations and 1 colored plate. Index. Price 25 s. London: Willian Heinemann Medical Books Ltd., 1949.

As stated by the author this text is modeled on the bacteriology written by Fairbrother quite generally used in England but not familiar to American students. There are thirty-six chapters divided into three parts: (a) general subjects, (b) descriptive and (c) clinical relationships. The essentials of bacteriology as far as they concern the practice of dentistry are covered quite adequately and the illustrations, although not elaborate, go well with the text. Chapter XXXII is of special interest, dealing as it does, with the technic of making cultures from teeth, both *in situ* and after extraction. The authors have been greatly influenced by the experiments and conclusions of McClean and Fish, nevertheless this chapter should be carefully studied by persons making cultures from teeth for either clinical or experimental purposes. The theory that the *Lactobacillus odontolyticus* (English equivalent of *L. acidophilus*) is the cause of the initial carious lesion is supported, although attention is given to the theories of Nord and Pincus. There seems to be little acquaintance with the American literature since 1940, at least there are no later citations. However references are not numerous and confined to a few listed on page XIV and occasional listings in the body of the text. There is a good chapter (IX) on antibiotics, but without any reference to aureomycin. This is one of the very good short treatments of bacteriology.

E. H. Hatton

ROSE'S LABORATORY HANDBOOK FOR DIETETICS

Revised and rewritten by Clara M. Taylor, Ph.D., and Grace Macleod, Ph.D. Fifth edition. 358 pages. Index. Price $5.00. New York: The Macmillan Company, 1949.

This edition has been divided into four parts instead of three. Part I gives a brief description of the functions of food and of food requirements for normal individuals, although the discussion under the heading of requirements is mainly one of allowances. Part II deals with problems in dietary calculation. Part III is made up of reference tables on equivalents, conversion tables of many types, and weight-height-age tables. Part IV includes tables on food composition. The latter are given in units of 100 grams, one ounce, one pound and 100 calories. Only table 35 which lists protein, fat, carbohydrate and calorie value of foods gives some measurements which enable the user to visualize the size of the portion. Thus, whenever one is using table 36 which gives vitamin and mineral content, cross reference is required to determine the actual contribution of the serving. It would be more practical to combine all data in a single table, including one category on the basis of an average serving. One could then quickly see the figures for the food in the quantities generally consumed at one time, as for example, a four ounce serving of meat (120 grams), a glass of milk (200 grams), one slice of bread (27 grams), thus saving considerable time and effort in computation. This criticism of the use of the 100 gram portion applies to most of the tables in Part IV. For example, the oxalic acid content of 100 grams of poppy seed or tea is seldom of practical value, whereas the quantity in average servings of foods could be useful.

The cumbersome percentage composition form used in the tables reduces the value of this book for use in dietary evaluation, but the book contains good reference material on summarization of functions and contributions of the various dietary factors, reference tables, and a bibliography of recent source material.

Dorothea F. Radusch

THE MENTAL AND PHYSICAL EFFECTS OF PAIN

By V. C. Medvei, M.D., M.R.C.P. 59 pages. Bibliography. Price $1.00. Edinburgh: E. & S. Livingstone Ltd, 1949.

This paper-bound book is a reprint of the author's article which won the Buckston Browne Essay Prize. It is very scientifically written with an exceptionally complete bibliography. It has value to students of psychology, and research workers in that field. The book is difficult reading for the average nonresearch person, and is of absolutely no value to the general practitioner of dentistry. The author admits that due to the limitations of the subject of the essay he has had to omit some phases of research. "In spite of this, the aim of this essay is to encourage the further study of pain with a view to its successful treatment," says the author. The book, especially the bibliography, would be of value as resource material to a medical research library.

H. Shirley Dwyer

STEDMAN'S MEDICAL DICTIONARY

Edited by Norman Burke Taylor, M.D., F.R.S.C., F.R.C.S. (Edin.), F.R.C.P. (Can.), M.R.C.S., (Lon.), in collaboration with Allen Ellsworth Taylor, D.S.O., M.A. Seventeenth revised edition. 1,361 pages. Appendix. $8.50 thumb index, $8.00 without thumb index. Illustrated. Baltimore: The Williams and Wilkins Company. 1949.

Besides several dental dictionaries, none very recent, there are several medical dictionaries on the market which attempt to fulfil the needs of the dentist and dental student. Among these, the Stedman's is probably the latest, and as such it has had the greatest opportunity to furnish the newest terms and to revise the definitions in the light of the most recent knowledge.

However, excellent as the new Stedman's may be as a medical dictionary, it has not made the most of its opportunity in the dental field. A casual check of various dental terms—some very common and of long standing, and others less usual and quite recent—reveals numerous shortcomings. These may be said to be partly failures to keep abreast of recent developments in the dental field as regards the inclusion of terms and their definition, and partly in a talent for unfelicitous wording of definitions. It does not seem possible that the editors could have had the benefit of advice from a competent dental lexicographer.

Perhaps the worst example of definition is that given for dental caries: "A gradual decay with excavation of the dentine of a tooth, due possibly to the action of *Leptothrix buccalis*, commonly present in the mouth."

In framing a definition of a disease, the lexicographer can safely take either of two courses—describe the disease without referring to its cause, or keep informed on advances in the study of etiology. Stedman's has done neither. The definition has been repeated in that dictionary for years (the earliest copy available to the reviewer was 1914); and since the theory given was introduced by Leber and Rottenstein in 1867, it was probably adopted by Stedman's in one of their earliest editions and has survived to the present.

This definition of caries contrasts unfavorably with that given in another recently published medical dictionary, which presents the prevailing view today: "A localized, progressive, molecular disintegration of the teeth, beginning with the solution of the enamel by lactic and pyruvic acids. The acids are the product of enzymic action of oral bacteria upon carbohydrates. . . . The initial process is followed by bacterial invasion of the dentinal tubuli. The acids formed break down and remove the inorganic constituents of the enamel and dentine, and the unsupported organic matrix is gradually removed, leaving the so-called cavity of decay."

Among other faulty dental definitions are the following (the italics are not in the original):

Torsoclusion: The condition of a tooth which is *twisted around its vertical axis.*

Neutroclusion: *Normal* occlusion.

Traumatic occlusion: Malocclusion of such a degree as to *cause injury to the opposing tooth or teeth.*

Partial denture: A set of two or more artificial teeth in one or *both jaws.*

Periodontium: Peridental membrane.

The last definition ignores present usage as indicated in the A.D.A. definition:

The investing and supporting tissues surrounding the tooth; namely, the periodontal membrane, the gingiva, and the alveolar bone.

These shortcomings of the new Stedman's are not altogether avoided in other medical dictionaries—a fact that emphasizes the need of a new, strictly dental dictionary.

George B. Denton

DELBRIDGE COMBINED SOCIAL SECURITY AND WITHHOLDING TAX CHART

Produced by Delbridge Calculating System, Inc. 59 pages. Price $10.00. St. Louis: Delbridge Calculating Systems, Inc., 1949.

This book is a series of charts for computing Social Security taxes under the Federal Insurance Contribution Act and withholding taxes for employees' income tax. These charts show exactly the amount to be withheld from an employee on a weekly basis, and the combined tax.

A scale of weekly deductions ranges from $0 to $200 per week. An unusual feature of this book is that fractional weeks are shown. The amount of income tax to be withheld is shown, but in the case of a fractional week the withholding tax and the social security taxes must be added. There is a detailed schedule of the 1½% Social Security tax on earnings from $0 to $153,000. There is also a shortcut method shown for keeping the individual's earning record required under the law.

For the dentist who desires considerable saving of time and labor along with maintenance of a high standard of accuracy for computing payroll tax deductions, this book is heartily recommended.

Lloyd H. Dodd

PRINCIPLES AND PRACTICE OF PLASTIC SURGERY

By Arthur Joseph Barsky, M.D., D.D.S.. 499 pages, 1029 figures, 1 color plate. Index. Price $10.00. Baltimore: Williams and Wilkins Company, 1950.

Although this book deals primarily with plastic surgery, there are many principles and technics presented throughout the text of special interest to the practitioner of oral surgery. This is a very worth-while work and should be included in the library of every oral surgeon for general reference for plastic and major oral surgical procedures.

The book is a practical guide and includes most of the conditions amenable to plastic surgery and describes the operations used successfully by the author and his colleagues. The first six chapters deal with the basic principles of plastic surgery such as skin grafts and other tissue transplantations, flaps and tube pedicles, and the treatment of wounds, burns, frost bites, scars and keloid. The next nine chapters cover the practice of plastic surgery as it applies to special parts of the body. The sixteenth, and last chapter, discusses the construction, fitting and management of prostheses.

Of particular interest to the oral surgeon is chapter ten, on harelip and cleft palate, in which the author discusses the various types of cleft lip and cleft palate and their treatment, and also goes into considerable detail in regard to secondary repair of cleft lip and cleft palate deformities. Operative technics and procedures are discussed in minute detail with numerous illustrations.

Chapter eleven, on the lips, cheeks and jaw, contains a discussion of many pathological conditions of interest to the oral surgeon. Congenital and acquired defects of the lips and their management are discussed and well illustrated. These include scar tissue contractures of the mouth, hyperkeratosis, malignancies, and traumatic tissue losses.

Buccal inlay grafts for the reconstruction of the vestibule of the mouth, and other common procedures for correction of this deformity, are well presented. The treatment of facial paralysis, developmental deformities of the mandible, and developmental deformities of the mouth receive adequate consideration.

Chapter twelve deals with fractures of the facial bones and their management. Various types of appliances are described, the repair of large defects of the jaw by means of bone grafts are shown. The author also discusses fractures of the bones of the middle third of the face and their management.

Chapter sixteen is devoted to a very comprehensive discussion of prostheses. It contains a discussion of the indications for prostheses, the methods of making molds and casts, and the materials best suited for these procedures. Prostheses are shown for the replacement of lost nasal, orbital, and oral structures, as well as for the replacement of lost ears, hands and fingers. The book contains five hundred pages and is printed on good paper, the numerous illustrations, diagrams, and photographs clarify the operative procedures, and show end results.

Reed O. Dingman

BACTERIAL INFECTION WITH SPECIAL REFERENCE TO DENTAL PRACTICE

By J. L. T. Appleton. Fourth edition. 644 pages with 108 illustrations and 5 plates, 4 in color. Index. Price $10.00. Philadelphia: Lea & Febiger, 1950.

This edition, like the preceding ones, has many of the characteristics of a review of the literature, the references and citations are very generous and comprehensive and the author allows the reader to make his own deductions and draw his own conclusions. He assumes that the necessary approach to an understanding of the part played by bacteria in dental practice is a working familiarity with the process of infection, and of the bacteria that produce infections. The 40 chapters are divided into three parts covering the three phases of the book's content. It is by far the best coverage of this subject known to me which is more than adequate compensation for the load placed on the reader, as it is not easy reading.

The chapters covering how bacteria produce disease are highly commended; chapter seven on sterilization and related subjects should be carefully studied by all practicing dentists; and the chapters on dental caries, focal infection and the pulpless tooth are equally worth careful study, especially the last paragraph on page 539. On the whole the author seems more favorably impressed with the focal infection concept as applied to the chronic infections about the teeth than is justified by the current judgment of clinicians. The principle of focal infection is a fully established bacteriological concept and that the spread of bacteria from some point of entry to other parts of the body is a well known occurrence, to use the author's own words. However, the opinion quoted in the middle paragraph on page 525 may be more favorable to the concept than is deserved.

Edward H. Hatton

CLINICAL NUTRITION

Edited by Norman Jolliffe, M.D.; F. F. Tisdall, M.D., and Paul R. Cannon, M.D. 925 pages with 78 tables and 127 illustrations, 61 in full color. Index. Price $12.00. New York: Paul B. Hoeber, Inc., 1950.

In this book, the facts about the basic constituents of food and the clinical results of their deprivation or utilization are assembled. The editors, who are experienced in nutrition, have contributed some of the chapters; the others are by well known authorities.

Multiple authorship always results in inconsistencies in interpretation and statement. In some instances the editors have called attention to these differences by reference footnotes. But the chapter on "Calcium and Phosphorus Malnutrition" appears to have some serious omissions and contains some statements which are misleading to those not familiar with the subject. On page 255 it is stated that "Primary calcium deficiency is extremely rare. The organism needs to replace the calcium lost as a result of the daily wear and tear of the skeleton. This amounts to a few hundred milligrams per day, and there is scarcely a diet which does not contain this quantity of calcium." Certainly if only a few hundred milligrams per day were sufficient, the Food and Nutrition Board of the National Research Council would not have set the daily allowance at one gram. The author made no reference to the experimental studies which indicate the low utilization of ingested calcium by adult humans. These significant data were the basis for the allowance.

One of the stated purposes of the book is to disseminate current knowledge to physicians so that they will give nutrition proper attention in everyday practice. For this, chapters on therapy (25-29) and some on individual nutrients (7, 9, 15 and 16) are especially well done. The graphic explanation for the delay in weight reduction, for example, if generally understood by physicians and explained to patients, would result in better cooperation in following prescribed diets.

The book is divided into three sections. In Part I, diagnosis and technics which may be useful clinically in detection of deficiencies are discussed. In Part II each nutritive element is described, while Part III is concerned with therapy and prevention. It would have been more logical to have had therapy follow directly after diagnosis. There is an Appendix of 70 pages. This includes dietary patterns, a table of food values and charts on contributions of average servings. The latter would have been more useful if measures of quantity had been consistently given. There are 10 pages of color photographs illustrating anatomic lesions associated with nutritional diseases. Most of these are of the lips, tongue and teeth.

All dentists and physicians will find a wealth of data in this book. All must be well informed so that advice given by one will not be nullified by casual or even derogatory attitudes of another. All have a vital interest in the effective application of nutrition. If the book were less comprehensive and detailed it would serve the busy practitioner better. I recommend careful selection and condensation of the material to make a more convenient handbook.

Dorothea F. Radusch

THE ORIGIN OF MEDICAL TERMS

By Henry Alan Skinner, M.B. 379 pages. Price $7.00. Baltimore: The Williams & Wilkins Company, 1949.

Dr. Skinner's book is a collection of words pertaining to medicine, including the names of numerous physicians and scientists whose work has associated them with medical terms. ". . . It is particularly directed toward the basic medical sciences of anatomy, physiology, biochemistry and pathology." It is a compilation rather than a work of research, designed principally "to place in the hands of medical students and those interested in medical terminology a general reference book of standard medical terms particularly those likely to be encountered by the medical student as he enters upon the study of medicine." The vocabulary, however, is not extensive enough to take the place of a medical dictionary. Much historical material is given with regard to many of the terms, but the background of a large number of words listed is slighted, and in this respect the book, while giving definitions, does not always justify its title.

The dentist's use of the book will be limited largely by his scientific curiosity and interest in the more general aspects of medicine and surgery. Many of the most important words in dentistry are omitted, and others are defined only in a nondental sense. Among the terms omitted are *extraction, tooth, teeth, eruption, filling, orthodontics. Occlusion, calculus, tartar, fluorine, condyle, ramus, prophylaxis, operculum* are included but without dental reference. The articles on *dens, saliva, premaxilla* are among the more informative dental discussions. Other interesting accounts deal with *iodine, microscope, phenol, syringe, protoplasm, sepsis, stain* (tissue), and *forceps*. The latter article, after asserting that "the oldest type of forceps is the dental variety," gives no

further information on this important instrument in dentistry. Horace Wells is not mentioned under the caption *nitrous oxide*, where it is stated, "In 1844 Colton in America successfully administered nitrous oxide gas for the extraction of a tooth." Morton is not mentioned under the head of *ether*, although both Wells and Morton are referred to in the article on *anaesthesia*, but without indication of their importance. Some of the personal names of dental interest are Hunter, Retzius, Purkinje, Nasmyth, Owen, all anatomists. Black, Tomes, and Magitot are omitted.

The volume is no doubt useful, but it is not sufficiently complete and original to supersede earlier reference works from which it borrows much. The user of the book in this country must remember that the spellings are mostly British.

George B. Denton

PHYSIOLOGY IN HEALTH AND DISEASE

By Carl J. Wiggers, M.D., D.Sc., F.A.C.P. Fifth Edition. 1,242 pages with 280 illustrations. Index. Price $10.00. Philadelphia: Lea & Febiger, 1949.

The fifth edition of this well-known textbook continues, as the title indicates, to link the preclinical subject of physiology with its practical application in the clinical studies. This feature renders the text very acceptable to medical students and practitioners.

Nothing demonstrates this more forcibly than the chapters dealing with the organs of circulation. Some readers may find a somewhat disproportionately large amount of space—25 per cent of the entire volume—devoted to this subject. However, considering the present high place of cardiovascular diseases among the causes of death, this may be most timely. It also may be a natural reflection of the immense volume of work which has issued from the author's laboratory during the last half century.

The modern trend, noticeable throughout, is especially evident in the chapter on the "Physiological Basis for Psychosomatic Reactions." The recent progress in our knowledge of the hypothalamus as the chief center of the autonomic nervous system and the part it plays in sleeping and waking is well told. The treatment of urinary secretion in which specific functions are ascribed to the two anatomic elements of the renal tubule merits special mention.

An excellent feature is the large number of tables and figures summarizing the knowledge gained.

Placing the references to the multitude of current articles scattered in many journals in the form of footnotes, but listing the monograms and reviews having a broader scope and, perhaps, more lasting value, at the end of the chapters will, no doubt, be appreciated by readers having limited time and library facilities.

The text is illustrated with many beautiful diagrams. A well constructed table of contents and the analytical index are of great value. The physical appearance of the book is excellent.

W. D. Zoethout

THE CHICAGO-COOK COUNTY HEALTH SURVEY

Conducted by the United States Public Health Service. 1317 pages. Index. Appendix. Price $15.00. New York: Columbia University Press, 1949.

The United States Public Health Service in 1946 conducted a comprehensive survey of health services, including tongue blade examinations in Chicago on 13,444 white children, which was 1.5 per cent of the total of 690,408 white children in the 5 to 17 year age group attending school. The same type of examination was given to 3,780 Negro children, which was 5 per cent of the total Negro children in the 5 to 17 year age group enrolled in the schools of Chicago. (1940 census figures)

The survey makes an evaluation of the dental status of these children and shows the caries prevalence pattern according to age and economic status. Statistics cover the number of private dentists in Chicago, giving the ratio of dentists to population, and the ratio of the distribution of dentists to economic areas.

A detailed description of the facilities for dental care, the number of dental clinics conducted by various community agencies such as the Chicago Health Department, the hospital dental clinics, the Chicago Department of Welfare, the Juvenile Detention Home and those maintained in industrial plants is included. The services rendered and the groups for whom they are intended are also covered.

Extensive recommendations for improvements in Chicago are made as a result of this study.

The Cook County Department of Public Health has at present no active dental care program. All the dental facilities under the direct control of this organization are now idle because of lack of funds and personnel

to staff a dental division. It will be necessary for the dental director of the Cook County Department of Public Health to survey the county and establish fixed dental clinics in areas where the case load will be large enough to support the facilities. For smaller communities, it would be more convenient to establish mobile clinics with portable equipment, which could be transferred from community to community.

Recommendations for the coordination and improvement of services in Cook County are suggested.

John Bergman

AN ANALYSIS OF GROUP LIFE INSURANCE

By David Weinert Gregg, Ph.D. 268 pages. Index. Price $3.75. Philadelphia: University of Pennsylvania Press, 1950.

The first contract of group life insurance was written in 1911. Today well over 20 million employees of American business are covered for more than 40 billion dollars of group insurance. This volume covers the history, principles and practices of group insurance in a manner that is complete, authoritative and interesting. It is part of a service of insurance studies issued by the S. S. Huebner Foundation for Insurance Education.

Part I deals with the origin, development and fundamental nature of group insurance, group selection and the general cost structure of both group and ordinary insurance. Part II analyzes the master contract which is issued by the insurance company to the employer, the certificate which is issued to the employee and the rights of the certificate owner. Part III covers the marketing of group life insurance and the methods of installation. This section also describes the administration and servicing of a group plan. Part IV deals with many technical aspects such as selection of risks, rates and premiums, dividends and rate adjustments, reserves and reinsurance.

Many current and prospective problems and important trends are fully discussed in Part V. Some of these are the effects of the business cycle, the cost of conversions and the cost of continuing insurance on retired employees. Also covered is the growth of new forms of permanent group life insurance and collective bargaining on group insurance benefits. This section closes with an evaluation of the significance of group life insurance, the service it renders, its limitations and its future.

The final 48 pages include valuable appendices and an extensive bibliography.

John L. Nelson

MODERN PRACTICE IN ANAESTHESIA

By Frankis T. Evans, F.F.A.R.C.S., D.A. First edition. 566 pages, 227 illustrations, one color plate. Index. Price $12.50. New York: Paul B. Hoeber, Inc., 1949.

In the past 10 or 15 years great changes have been made in the field of anesthesiology. New agents to produce anesthesia have been developed and refinements in their administration are in common use. New and improved drugs are used as preanesthetic and postanesthetic medication. Important drugs are now being used as adjuncts to the anesthetic drug to produce the quality of anesthesia to which modern surgeons have become accustomed.

This book covers the entire field of anesthesiology with exceptional thoroughness. There are 38 chapters, each dealing with a particular phase of the subject. Frankis T. Evans has written eight of these chapters and has served as editor of the book. He has delegated the writing of the remaining 30 chapters to 24 contributors, each a specialist in the field of which he writes.

The care which the editor has used not to omit important information is attested by the fact that all of the newer drugs used by the anesthetist are included. There are chapters that deal with the anatomy, physiology and chemistry which are of importance to the anesthetist. Agents used to induce both local and general anesthesia are fully discussed as to their properties and the method of their use. Choice of the anesthetic agent most suitable for the various operations, as well as changes in plan which should be made for the patient with certain debilities, are thoroughly described. A generous portion of the book deals with preanesthetic and postanesthetic care of the patient. Accidents attendant on the use of anesthesia are described and suggestions for corrective measures are given. Case histories of deaths and near deaths which have been the result of anesthesia are included.

In the general discussion of anesthetic agents, approximately 10 pages are devoted to nitrous oxide. Chapter 32 deals with analgesia and anesthesia as it is used for dental surgery. Most of the material presented deals with nitrous oxide. This chapter is complete with methods of administration, pre and postoperative care of the patient, and measures which are to be taken in the event of an emergency. While nitrous oxide has the place of importance in this chapter, the use of ethyl chloride as well as intravenous anesthesia in dental practice is described.

This book is not primarily concerned with anesthesia for dental or oral surgery. However, the line cannot be drawn sharply between any

specialties of anesthesiology. This book contains a vast amount of fundamental information which should be of interest to anyone who is called upon to administer anesthesia.

Warren R. Schram

HANDBOOK OF MEDICAL MANAGEMENT

By Milton Chatton, M.D.; Sheldon Margen, M.D.; Henry D. Brainerd, M.D. First edition. 475 pages. Index. Price $3.00. Palo Alto: University Medical Publishers, 1949.

This handbook is a concise reference intended for the medical student and medical practitioner. It should also be a valuable aid to the dental profession. The text is well done in outline form, presenting a short description of the disease, etiology and treatment.

The chapter on diseases of the skin should be a handy reference for the dentist, inasmuch as many of these lesions occur about the head and neck. Since the dentist often plays an important role in the early detection of malignant lesions in the mouth, the section on neoplasms is informative and gives us a better understanding of these abnormalities.

Chemotherapeutic agents are discussed; penicillin, streptomycin, aureomycin, chloromycetin and others; indications for their use, absorption by the body, distribution, mode of action, toxicity and its management. The book also treats the use of various pain-relieving drugs, vitamin therapy, diet and nutrition.

In general, the text is well presented and would be a worth-while addition to the dentist's library.

J. S. Restarski

GRANULOMATOUS INFLAMMATION: ITS NATURE, GENERAL PATHOLOGICAL SIGNIFICANCE AND CLINICAL CHARACTER

By Wiley D. Forbus, M.D. First edition. 58 pages. Illustrations. Price $1.85. Springfield, Ill.: Charles C Thomas, 1949.

This small book includes three pages of references to other works on the subject. The binding and printing of the book have been unusually well done. There are 25 illustrations, most of which are photomicrographs.

The author's treatment of his subject is well outlined in his introduction. He states his five main objectives as: "(1) the presentation of a brief review of the basic pathological processes involved in granulomatous inflammation; (2) the reorientation of certain basic pathogenic factors involved in granulomatous inflammation; (3) the illustration of the proposed change in emphasis necessary to the reorientation of the question of granulomatous inflammation by means of a description of certain observations recently made in our own work on one of the more unusual infectious granulomata; (4) a brief statement of the importance and general pathological significance of granulomatous inflammation; and (5) the brief description of the distinguishing clinical characteristics of granulomatous disease."

Dr. Forbus presents his material in an academic manner, and yet much of it has direct clinical application. As an example, on page 52 it is stated, "Granulomatous inflammatory reactions are characteristically poor in circulation. An important result of this is difficulty in reaching the etiologic agents with therapeutic materials introduced into the blood."

This book presents much fundamental information on the subject, and in not too many pages.

Warren R. Schram

PSYCHOANALYSIS

By Edward Glover, M.D. Second edition. 367 pages. Index. Price $3.50. New York: Staples Press, Incorporated, 1949.

This volume is written at a level that facilitates understanding and application of the principles of psychoanalysis by groups outside the restricted field of psychiatry, but at the same time it does not oversimplify or popularize this method. The author, who is a recognized authority and who has devoted much attention to Freudian teachings, writes in a style that is stimulating and easily followed.

Three sections comprise the book. In the first, which discusses the theory of psychoanalysis, there are seven chapters dealing successively with the embryology, dynamic aspects, structure and economics of mind, phases of mental development, dreams and symptomatic acts, and symptom formation. Special emphasis is placed upon origins of problems as they relate to development in infancy and early childhood. Glover believes that the fateful period in this connection is the third year.

Dealing with clinical psychoanalysis, the second section includes chapters on psychoneuroses, psychosomatic disorders (with rough handling of psychosomatic specialists), psychoses, psychosexual disorders and psychoanalysis in children. The final section contains a chapter on practical applications, an appendix presenting modifications of psychoanalytic therapy, an extensive and very helpful glossary,

and a list of publications recommended for collateral reading.

Although one might quarrel with some of the opinions held by the author regarding Freudian principles, in general this book can be considered a stimulating, instructive summation of pyschotherapy providing practical application and understanding in many fields of the healing arts.

William W. Bolton

THIS I DO BELIEVE

By David E. Lilienthal. 208 pages. Price $2.50. New York: Harper and Brothers, 1949.

"When we say democracy is a way of life, we mean just that: a way of living each day, and not simply a matter of laws and government. . . . What as individuals, can we do to safeguard and to nourish this great inheritance? I say: Search our minds and our souls and find out what it is we believe about democracy and about America. Knowing that, hold fast to that in which we believe, and let neither force from without, nor guile nor fears from within, cause us to forsake those precepts in which as Americans we deeply believe, and from whence comes our strength."

The above quotation tells the story of this book. It is the credo, sincerely and humbly written, of David Lilienthal. Whether or not we agree with Mr. Lilienthal's political affiliations, we cannot help but agree with his political philosophy as expressed so eloquently in this book.

At a time when doubt, witch-hunting, and slander are the favorite tools of certain publicity seeking political leaders, it is refreshing and encouraging to renew our faith in America and our democratic way of life, through the pages of this book. It is not a textbook; it is not scientific; it is an inspiring expression of faith. As such it should be on the reading list of every one of us.

H. Shirley Dwyer

GROUP MEDICINE AND HEALTH INSURANCE IN ACTION

By Robert E. Rothenberg and Karl Pickard (assisted by Joel E. Rothenberg). 278 pages. Price $5.00. New York: Crown Publishers, 1949.

The Central Medical Group of Brooklyn is organized as a partnership of physicians, affiliated with the Health Insurance Plan of Greater New York. The present report is a comprehensive and thoroughly documented account of its actual experience in prepaid medicine and group medical practice. Physicians contemplating the development and organization of a medical group will find this book of immense value. It records the volume of physicians' service required annually by the population served, the number of specialist and auxiliary services rendered, the administrative costs of operating the medical center, and the net income available from the capitation payments by HIP for the remuneration of the physicians. The authors give an interesting analysis of the main legal aspects, medical standards, and physical requirements for medical group quarters.

The critical reader, however, will be disappointed by the superficial historical review of health insurance plans. The authors' advocacy of a national health program patterned after their local experience seems a trifle naive. A further shortcoming is the omission of an index. Despite these limitations, the book merits careful reading by persons concerned with the future of American medicine and the problem of providing comprehensive medical care at a low cost.

Samuel Herman

PRINCIPLES AND TECHNICS FOR COMPLETE DENTURE CONSTRUCTION

By Victor H. Sears, D.D.S. First edition. 406 pages with 95 illustrations. Index. Price $5.00. St. Louis: The C. V. Mosby Company, 1949.

The approach to complete denture construction logically is made from the viewpoint of the scientist and the artist. The engineer-dentist should be aware of theories and principles regarding the scientific factors concerned with the replacement of the natural dentition; he also must apply intelligently his artistic skill in order to achieve a satisfactory result.

Dr. Sears has arranged his material so that the odd numbered chapters deal with principles and the even numbered ones deal with their application.

In the introductory chapters the author considers terms, factors, materials, equipment and physical principles. Later he describes the taking of primary and secondary impressions and jaw relation.

He explains in detail the problems of anterior tooth selection emphasizing such points as observation, balance, perspective, proportion, line, detail, texture, light and shade, color, contrast, framing, grouping, esthetic norm, and asymmetry.

Dr. Sears has presented in a convincing way how the ultimate selection and arrangement of the anterior teeth is accomplished.

In the average case, all four first molars are of porcelain or some other resistant material. The other teeth are of synthetic resin or some other material abraided more easily than the first molars. Cusp interference is reduced to zero and the occluding surfaces are cuspless. Reduction of working occlusal surfaces is accomplished by depression of the buccal point of the lower teeth and cupping out the upper buccal cusps. To centralize the working occlusal surfaces, only the second bicuspids and first molars are left in contact.

The try in and testing of wax model dentures, processing and installing the finished dentures are adequately explained by the author. He touches on adjustments of old dentures, explains an immediate denture technic and describes the remodeling and refitting of dentures.

Dr. Sears' book is one of the best organized texts that has been published in years. He considers each problem clearly and logically. His book will merit serious consideration by both the experienced practitioner and the dental student.

David P. Redmond

EPILEPSY AND CONVULSIVE DISORDERS

By Edward M. Bridges, M.D. 670 pages. Illustrated with charts and plates. Index and bibliography. Price $8.50. New York: McGraw-Hill Book Company, 1949.

This monograph on the convulsive disorders in children brings all aspects of the subject to the clinical fore. The author evaluates each factor that bears on this complex problem as a basis for the effective management of the individual case. It involves the role of heredity, cerebral injury, intercurrent disease, diet, emotion, personality, the attitude of himself, his family and his associates toward this type of disease. Each of these aspects of the problem is given due consideration for the total management of the affected child. Such an application displaces the prescription of an anticonvulsive drug as the routine procedure and offers instead a wholesome therapeutic armamentarium that will accrue to the developmental advantage of the child and the psychological responses of the parents. Each chapter is followed by a bibliography which is, unfortunately, duplicated alphabetically in the appendix. Since the book is intended for physicians as well as parents and social workers there is needless repetition. To appease parents, more emphasis is given to everyday management than to more effective forms of treatment. Great stress is placed upon surgical treatment of convulsions arising from localized cerebral lesions. The book is well written, clearly illustrated and carefully documented. It is invaluable in the complete management of a child with any form of chronic convulsive disorder.

I. Newton Kugelmass

PRE-PROFESSIONAL EDUCATION IN DENTISTRY

Prepared by Thomas Cowling, M.A., D.D.S., B. Paed. 69 pages. Toronto, Canada: Canadian Dental Association, 1950.

Over a period of several years the Council on Dental Education, Canadian Dental Association, has given study to the subject of preprofessional education. As a result of this study the Council commissioned the late Thomas Cowling to write a report upon the subject.

While the report is not to be considered final in its recommendation, many of the suggestions have merit and deserve serious consideration. Its publication will serve the dual purpose of furnishing further light upon a controversial subject and contributing something toward the establishment of a satisfactory standard of academic requirement for undergraduates entering the professional course of instruction.

A limited number of copies are available for individuals interested in the field of education and may be obtained by writing the Secretary of the Canadian Dental Association, 211 Huron St., Toronto, Canada.

Don W. Gullett

ORAL HISTOLOGY AND EMBRYOLOGY

By Balint Orban. Second edition. 364 pages, 265 illustrations, 4 color plates. Index. Price $8.00. St. Louis: C. V. Mosby Company, 1949.

An outstanding feature of any book bearing the name of Dr. Orban has been the excellent photography which displays clearly the particular features that are emphasized in the text. Many of these splendid illustrations were incompletely labeled in the first edition but revision has remedied this defect. Good photomicrographs are better teaching aids than good drawings, and this text meets this demand. It is regrettable that several photomicrographs used in the first edition published in 1928 have been omitted in this edition. The few

diagrams used are clear and are advantageously placed. The text has undergone some revision which makes it more understandable to the student.

The organization of each chapter follows the same pattern as in the first edition. The question always arises whether tooth development is best discussed in one general chapter or whether it is better to have one chapter devoted to each tissue.

Special reference should be made to the chapter on the "Development of the Face and Oral Cavity." This chapter will be rewarding to any reader because of the clearness with which the material is presented.

Reference has been made to the latest form of study of enamel. While this study is still in its infancy, its inclusion in this edition shows that the text is up-to-the-minute.

J. R. Schumaker

ROOT CANAL THERAPY

By Louis I. Grossman, D.D.S., Third edition. 368 pages, with 119 illustrations. Index. Price $6.50. Philadelphia: Lea & Febiger, 1950.

Any book on root canal therapy which runs into its third edition within a period of ten years has merit. This fact alone is more important than any benefit which can be derived from creditable comments in a short review.

This latest edition of *Root Canal Therapy* has been thoroughly revised. New material has been added to bring it up-to-date, and many new illustrations have replaced those in the previous editions.

Doctor Grossman presents a logical and systematic discussion of his subject. The text is well planned and generously illustrated by the author, who is familiar with the clinical problems as well as the pedagogic aspect of his subject. The last chapter, "Root Canal Treatment of the Deciduous Teeth," again is edited by Elsie Gerlach, D.D.S. A comprehensive bibliography of the pertinent literature accompanies each chapter.

The book adequately covers the newer advancements in this field, and is recommended to the clinician and student alike. Of special note is the revision of the topic on antibiotics. The author stresses a penicillin-streptomycin-bacitracin-sodium caprylate suspension, which he has found effective against all types of organisms in affected pulp canals. Once again Lea & Febiger are to be congratulated on the art of bookmaking as expressed in the make-up of this volume.

E. Alan Lisban

COMPANHIA DE DIAMANTES DE ANGOLA (DIAMOND COMPANY OF ANGOLA)

Illustrated. Published by The Diamond Company of Angola, Lisbon, 1949.

An interesting publication was recently received prepared by the Health Department of the Companhia de Diamantes (Diamond Company) of Angola, a Portuguese colony in South Africa. Two long articles treating dental characteristics and blood groups of the native population are presented.

Written in Portuguese, and printed on high quality glazed paper, profusely illustrated, this publication should prove of interest to those engaged in studies of primitive races.

The lead article, "Contribution to the Study of Dental Characteristics of the Indigenous Population of Lunda," by Reinaldo de Almeido, is a 42 page work on native dental conditions. There are numerous charts and statistical tables covering such points as sex, age groups, maleruption of teeth, congenital defects, caries, malocclusion due to various dental diseases, supernumerary teeth and survey of some perfect dentitions.

As among many primitive people, there is frequent mutilation of the teeth to conform to the native ideas of esthetics.

Sound dentures in perfect occlusion appear to be the exception. Indeed, quoting some investigators as stating that the Negro denture "is usually more sound and in better occlusion than that of the white race," the author remarks that he doubts if such commentators have ever actually lived among the Negroes.

Article 2, by J. H. Santos David, is a study of "Blood Groups of Native Populations of Lunda and Songo."

Martha Ann Mann

LOWER PRICES COMING

By William J. Baxter. 90 pages. Paper bound. Price $1.00. New York: International Economic Research Bureau, 1950.

Mr. Baxter contradicts those who say that prices will be held at a high level because the government cannot afford to let them go down. He is of the opinion that the government has no control over the level of prices. He tells the man who is harassed by inability to save substantial amounts that he will get relief through tomorrow's lower prices and higher rates of interest on his savings. These will come about, he says, because of the nation's productive capacity, which is tremendous mainly because of the marvels of science.

On the premise that economics is "just common sense, after all," Mr. Baxter eschews technical terminology and claims to clear up all in economics that has been obfuscated by the scholars. I find his "home-cooked" economics not to my taste. Although he is effective in explaining certain current economic phenomena, the only "proof" offered for most of his points is in the form of anecdotes and wisecracks. Making the extreme statement on almost every issue (his favorite word seems to be "stupidity"), he caters to the audience which can see only black and white. This may result in easy reading but it does not, in my opinion, lead to the truth.

Instances in which his "factual" information appears to be wrong include his claim that we are now in a period of "very high rentals," and his statement that the only ones who are well off today are the older people. It is a matter of record that rentals are at a low level today compared with other prices, and it is a matter of common knowledge that older people are at a disadvantage because the dollars they saved have shrunk in buying power.

Add to the foregoing a dash of illiteracy and Mr. Baxter's home-cooking turns out downright unpalatable. For example, ". . . there is so much oil in the world that it is literally coming out of people's ears." Or, ". . . there were nearly $19,000,000,000 outstanding. . . ."

On the favorable side is his explanation of the terrific cost of the war, how we are feeling it now and will continue to feel it. Revealing, also, is the explanation of how high-priced labor is resulting in much work being done by the family which formerly would have been done by professional carpenters, painters, garment workers, toymakers, and so forth.

B. Duane Moen

COMPULSORY MEDICAL CARE AND THE WELFARE STATE

By Melchior Palyi. 156 pages. Index. Price $2.00. Chicago: National Institute of Professional Services, Inc., 1950.

The author presents, in interesting form, a record of the development of compulsory medical care plans in Europe and analyzes the economic, political and social implications and results of such plans.

The historical references and illustrations of the welfare state schemes from ancient and medieval times to the present are good and should make Americans realize that we are dealing with an inherent weakness of humanity: a desire of most humans for something cheap or gratis and the promise of demagogues to give it to them. The author aptly states "under dictators the Police State utilizes the Welfare State as their instrument, facade and justification, while in democracies the Welfare State is the beginning and the Police State the end and all experience shows the two merge sooner or later."

Another startling observation of the author is his belief and demonstration of the fact that all modern dictators—communist, fascist, or disguised—have at least one thing in common: they all believe in social security, especially in coercing people into governmentalized medicine. He states: "the suspicion that the solicitude of notorious tyrants for the welfare of their subjects must have something to do with the political nature of the medical security systems was one consideration that inspired this study."

The author covers quite thoroughly the present schemes, both voluntary and compulsory, the dynamics of compulsory medicine and costs. He also shows the effect of compulsory plans on medical practice and on the service rendered those covered by the schemes.

The book is well written, brief enough to be interesting and informative enough to give the reader a basic understanding of the great social problem facing us in this country. It is recommended for reading by professionals and nonprofessionals alike.

William McGill Burns

BIOLOGICAL FOUNDATIONS OF HEALTH EDUCATION. PROCEEDINGS OF THE EASTERN STATES HEALTH EDUCATION CONFERENCE, APRIL 1-2, 1948

169 pages. Price $2.50. New York: Columbia University Press, 1950.

This book should appeal to all persons in the health professions, who certainly should be health educators, as well as to all other persons in the education field.

This book is a collection of papers prepared for a technically educated group, and while most of the information it contains is interesting and very helpful, parts of the text may make rather dry reading.

An excellent reference for all those interested in or responsible for health and health education.

Hugo M. Kulstad

Current Literature

REHABILITATION OF THE CLEFT PALATE PATIENT

William G. Houghton, Am. J. Orthodont. 36:342. May, 1950.

This presentation resulted from watching the aftermath of orthodontic treatment for two cleft palate patients. After completing orthodontic treatment for two patients, Jack and Rogene, it was obvious that very little had actually been done to raise their social plane or change their inferiority complexes. This fact was disappointing. By constructing speech appliances for these two patients, they were then mechanically equipped for speech training.

Without trying to make a storybook ending, it will suffice to say that this was the secret of the success of both of these patients, who are now happily adjusted in social and student activities.

Orthodontists should assume considerable responsibility in regard to the cleft palate problem, for they will be consulted by most of these patients sooner or later.

Cleft palate cases fall into the following categories:

1. The completely successful operative case in which the cleft was successfully closed and normal function of the soft palate restored.
2. The partially successful operative case in which the hard palate may be closed, but in which soft palate function was impaired causing defective speech.
3. Natural clefts, either complete or partial, which for some reason or other were never operated on at all.
4. Those individuals in whom may be present an abnormally short soft palate, resulting in a poor anatomical relationship between the soft palate and the pharynx.

There are certain fundamental principles that must be kept in mind in the construction of the speech appliance.

1. An accurate impression of the teeth and their surrounding tissues.
2. Exact and balanced clasp retention.
3. Passive adaptation of the extension piece over the soft palate.
4. Proper muscle trimming of the impression for the tailpiece which extends into the pharynx.
5. The exact horizontal location of the tailpiece in relation to Passavant's cushion. (Passavant's cushion is a certain bulging area on the posterior pharyngeal wall caused by the constriction of the superior contrictor pharyngis.)

There should be the closest teamwork between the prosthodontist and the speech instructor. A mechanical genius may build a fine musical instrument, but without the skilled teacher of music the instrument would be useless. So it is with a speech appliance in its relation to the cleft palate pupil.

William F. Ford

THE EVOLUTIONARY SIGNIFICANCE OF THE PROTOSTYLID

Albert A. Dahlberg. Am. J. Phys. Anthropol. 8:15. March, 1950.

The protostylid is a rudimentary cusp arising from the cingulum of the permanent lower first molar and deciduous lower second molar, on the buccal surface mesial to the buccal groove, which it diverts distally. It is found only on the molars of primates, frequently in anthropoid apes, in fossil man, in primitive peoples (notably the Pima Indian), and very rarely in the white race today, although in modern man related structures are sometimes present, such as a pit and distal bending of the groove at the same location. The presence of this character on the first molar—a tooth resistant to evolutionary change—suggests that the primitive pattern, in these cases, has persisted; and the residual evidence of pits and deviations of the groove in modern man points to affinity between the primitive and modern tooth forms.

George B. Denton

ORTHODONTICS AS A HEALTH SERVICE

John T. Fulton, Am. J. Orthodont. 36: 336. May, 1950.

Dentistry has a vital part to play in the World Health Organization. In this connection, one of the charts from the Study of Child Health Services, recently published by the American Academy of Pediatrics, shows the maldistribution of dentists in our country according to population. Wide differences also exist in the various regions, as well as in different counties in the same state. As might be expected, the rate at which children visit the dentist follows the same general pattern; wide variations be-

tween regions, the states within the regions, and the counties within the states. Community dental clinic services also follow this pattern. Probably the most striking and consistent pattern of this study comes from relating health services to the per capita income. That health services for children are directly related to the economic level of the state appeared in every phase of the study.

The place of orthodontics in this picture is not clearly defined. The study showed that orthodontics comprised only 0.8 per cent of the total number of dental services provided in children's dental clinics. Furthermore, 88.0 per cent of these orthodontic services were given in greater metropolitan counties and 87.5 per cent were provided in the northeastern and central group of states.

An impressive stride was taken by the American Association of Orthodontists last year. This organization established a public health committee designed to keep abreast of the growing interest in the provision of orthodontic care. Near the end of the year, this committee met in a two-day session with the Children's Bureau. Paramount in the discussion at these sessions were those areas of child health service in which orthodontic participation is badly needed.

As pointed out, orthodontics is practically nonexistent in public health dental programs. Less than 1 per cent of the total visits per year to children's dental clinics was given over to orthodontic problems.

Every state in the Union now has an official agency conducting programs for crippled children. Although the definition of handicapping conditions varies in these jurisdictions, cleft palate is included by all. Twenty-eight of these official state agencies are using the services of orthodontists in the rehabilitation of cleft palate patients.

William F. Ford

CARIES CONTROL: ITS INFLUENCE AND EFFECTS ON MALOCCLUSION

Wade R. Plater. Am. J. Orthodon. 35:790, October, 1949.

There is no complete agreement in the literature as to the percentage of malocclusion caused by early loss of tooth material. The mean may fall anywhere between 18 and 35 per cent, depending on who made the classification. They fall into three groups: (1) early loss of 6-year molars; (2) premature loss of deciduous molars through caries; (3) loss of arch length due to caries and breaking down of contact points of deciduous and 6-year molars.

Results of surveys are as follows: Green Bay, Wisconsin had 2.3 ppm. fluorides in the municipal drinking water supply. Sheboygan, Wis. had 0.05 ppm. in their drinking water, or one-twelfth of one per cent. Decayed and missing deciduous posterior teeth in Sheboygan was four times that of Green Bay.

Union Grove, Wis. had 1.0 ppm. fluorides and Madison, Wisconsin had 0.05 ppm. fluorides. Madison showed three malocclusions to Union Grove's one; 57 extracted 6-year molars to Union Grove's none; seven times as many extracted deciduous teeth in the 6 to 8 year old group in Madison as in Union Grove.

The presence of fluorides in the water leads to many well formed dentures in Union Grove and other cities, because of the absence of the loss of tooth substance, whether by extraction or by flattening of the contacts through decay.

Certainly there are malposed teeth in fluorine areas because there are many important factors influencing the position of erupting teeth. It has been observed, however, that these cases of malocclusion are much less extreme. They are mild, comparatively speaking, to those seen in Madison. If it is possible, by this simple, economic method, to reduce the incidence of decay by 50 per cent, possibly more, the incidence of malposed teeth might be reduced by 20 to 30 per cent.

William F. Ford

SUBLUXATION OF THE TEMPOROMANDIBULAR JOINT

William Rosenbaum, D.D.S. J.D.A. South Africa (Official) 23:1920, April, 1949.

Drugs are used for relief of subluxation of the temporomandibular joint and no danger is involved if technic is properly carried out. Louis Schultz of Chicago stated that he has treated five patients suffering with this ailment by injections of a sclerosing agent Sylnasol (sodium psylliate) successfully. Five hundred cases of subluxation of the temporomandibular joint have been studied at Bellevue Hospital and New York University.

The temporamaxillary articulation, being situated under the zygomatic arch is made up of the condyle of the mandible and the articular eminence of the temporal bone. An interarticular fibrocartilaginous disk located between the condyle and the temporal bone is surrounded by the capsular ligament. The joint, permitting motion in all directions except an axial rotation, assists in mastication of food. Normally the condyle moves in the

glenoid fossa, and when the mouth is opened wide it advances onto the eminentia articularis. When the jaw is depressed the condyles glide from the glenoid fossa onto the articular eminences.

Dislocation or luxation of the lower jaw, which is caused by external violence or muscular action, may be either unilateral or bilateral. Force applied to the jaw may damage the external auditory meatus and on the other hand inflammation of the middle ear may involve the articulation.

Yawning, slight violence, trauma to the side of the mandible and forcible opening of the jaws may cause subluxated joints. In these circumstances the ligaments stretched beyond normal limits do not recover unless adequately treated. Pain, occurring when mandible is moved, is one of the symptoms of subluxating joints. The deformity of complete dislocation which can be seen and palpated and the audible click are symptoms of this condition. Severe ringing in the ears, headaches and a grating sound often are present. A careful history and all symptoms are considered when making a diagnosis. Excessive space between the upper and lower teeth, and facial deformities accompany this condition. An examination of the teeth and temporomandibular roentgenograms are important in completing the diagnosis.

Previous treatments, largely surgical in nature, appear to be unsatisfactory and therapeutic injections as used by Schultz are recommended as treatment for luxation. The contraindications to this form of treatment are excessive motion without pain, clicking, grating, or locking and excessive motion in one joint. The treatment consists of injections of a sclerosing agent into the joint cavity which tightens the capsule. Several injections may be required and more relief is often noted in patients who have experienced severe reactions after injection.

The method consists of first injecting a 2 per cent procaine solution followed by Sylnasol in combination with a base of eucupine solution in oil, which produces firm mature fibrous tissue.

The skin area, between the tragus and the external ear, is sterilized, and 4 minims of procaine are deposited into the glenoid fossa and 10 minims of a 5 per cent solution of eucupin and Sylnasol are then injected. The same procedure is repeated on the other side. The patient, restricted to a soft diet, is instructed to apply hot compresses and take aspirin for relief of pain. An examination is made in one or two weeks and a second injection is made after an interval of three weeks if necessary. The majority of patients may have interference with chewing following the injection, swelling may result at the sites of the injections, and the relation of the teeth may be temporarily shifted.

R. R. Foskett

THE TREATMENT OF ADVANCED PARODONTAL DISEASE

E. Wilfred Fish. J.D.A. South Africa (Official) 5:202, April 15, 1950.

Advanced periodontal disease is described on the basis of excessive pocket depth, loosening and displacement of the teeth. The etiology and the sequence of the tissue changes in periodontal detachments are discussed. Toxins and mechanical agents are considered as playing a major part in the induction and progression of tissue breakdown.

Treatment is based on a knowledge of the histopathology of the involved tissues and may include the following measures: extraction of hopelessly involved teeth, excision of pockets, appropriate oral hygiene, grinding to adjust the occlusion, and splinting of loose teeth.

The various steps of the technical procedures are discussed and diagrams serve to emphasize various phases of treatment.

Donovan W. Brown

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THE TREATMENT OF CANCER OF THE GUMS

George S. Sharp and Robert C. Wood

During the last 10 years, the newer chemotherapeutic agents and improvements in anesthesia have made it possible to perform block resections on portions of the gum, alveolar ridge and mandible or maxilla, and to repair

a mandibular defect with a bone graft. This procedure is now offered as the desired one for both prognosis and esthetic results. The differences between cancer of the gum and malignant tumors originating in other parts of the oral cavity can be explained on an anatomic basis. The primary lesion is, from the onset, in close proximity to bone, and invades it at an early date. Lateral extension is also great, and as the mucous membrane of the gums is continuous with adjacent structures, early spread of gingival cancer into the floor of the mouth or the cheek is common. Ordinarily, the periosteum is resistant to tumor invasion, but the persistent use of dentures over the lesion may force this early invasion. Metastatic spread to regional lymph nodes apparently takes place sooner and more often from the lower (66 per cent) than from the upper gum (34 per cent).

Prophylactic oral hygiene is the primary early step in the treatment. Diseased teeth should be removed if irradiation is to be employed. A small growth (2.0 cm. in diameter or less) with little bone invasion may be destroyed with equal regularity by either roentgen therapy or by local excision. Carcinomas of larger size and with evidence of extensive invasion are best treated by partial resection or hemisection of the maxilla or mandible. More favorable results may be expected from cancer of the gums than from lesions on other oral surfaces. At the end of five years in a follow-up study, in 36 per cent of the unselected cases the patients were well and free of disease.

RESPIRATORY AND CARDIAC STIMULANTS AND RESUSCITATION

Lloyd C. England

Most dental general anesthesias are of short duration, but there is always the possibility of an emergency and it is necessary to have available for immediate use a kit containing three or four effective respiratory and cardiac stimulants and a sterile syringe. In the event of respiratory arrest the heart continues to beat for about two minutes. One of the greatest safety devices to use in such a situation is the emergency oxygen valve and a technic for inflating the lungs. All practitioners should be familiar with the methods of manual resuscitation. Nikethamide (Coramine) is used primarily for acute nervous system depression. The dose is 1 to 3 cc. Pentamethylenetetrazol (Metrazol) is a relatively nontoxic drug and is an effective cardiac and respiratory stimulant. Caffeine excites all portions of the central nervous system. Two widely employed soluble salts are citrated caffeine and caffeine with sodium benzoate. For hypodermic use the benzoate salt should be used. Atropine, a moderate respiratory stimulant, is used to better advantage preoperatively to reduce mucous secretions. Therapeutic applications of strychnine have no rationale, and intravenous digitalis is used for moribund patients after artificial resuscitation methods have failed. Epinephrine occasionally produces dramatic results but much more often it fails entirely. It is wise for dentists to familiarize themselves with three or four effective resuscitants and to be sure they know how to use them to best advantage.

MIXED TUMORS OF THE PALATE

Adolph Berger

The origin of mixed tumors of the palate is obscure. The histology of the tumors lends force to the theory of their origin from aberrant embryonic cells. They may be superficially or deeply lodged within the adjacent tissues. The covering mucous membrane may be normal, or it may be thinned, glossy and discolored. The growths vary in consistency, some being almost fluctuant while others are of a soft rubbery consistency. Roentgenograms are of little diagnostic value as they are obscured by the overlapping of the outer plate of the maxilla and the alveolar bone. Some of the mixed tumors of the palate are completely encapsulated, while in others the encapsulation is incomplete, in which case it is the anterior part that is encapsulated. The cellular elements of these growths do not conform to a uniform pattern. Some consist of undifferentiated cells held together by a sparse connective tissue stroma suggesting malignant tendencies; others are clearly benign, and others exhibit glandular acini and other individual characteristics. The removal of incompletely encapsulated lesions presents a problem, since that portion of the growth which merges into the soft palate and into the pillars of the fauces must be visually traced. This report is based on 12 cases of mixed tumors of the palate, and presents their photographs, their pathology, the method of removal and the results obtained.

CLEIDOCRANIAL DYSOSTOSIS

Harry M. Seldin, Daniel Seldin and William Rakower

When certain skeletal, facial and oral malformations occur, with a concomitant failure

of the clavicles to develop, a syndrome is produced which is called cleidocranial dysostosis. Associated with the lack of clavicular development, there is a prolonged retention of the deciduous dentition and a failure of eruption in the permanent dentition. There is evidence to support the theory that some hypophyseal dysfunction may be an underlying factor in the production of the syndrome of cleidocranial dysostosis. The prolonged retention of the deciduous teeth and failure of most of the permanent teeth to erupt, obviously leads to malrelation of dental arches with consequent periodontoclasia and necessity for prosthetic replacements. In selected cases, all the embedded teeth, together with the deciduous dentition, may be removed in one or more sittings, in relatively close order, with the maintenance of an ample, adequate ridge for accommodation of artificial dentures.

SCLEROSING SOLUTION IN THE TREATMENT OF CHRONIC SUBLUXATION OF THE TEMPOROMANDIBULAR JOINT

L. E. McKelvey

In the normal joint when the mouth is opened the condyle, along with the disk, moves forward onto the articular eminence. In subluxation the latitude of movement is increased with stretching or tearing of the capsular ligament, the peripheral attachment of the meniscus or the fibers of insertion of the external pterygoid muscle. The failure of the meniscus to maintain its normal relation may lock the jaws in certain positions, resulting in crepitation, trismus and pain. From investigation in the use of 5 per cent sodium psylliate emulsion injected into the temporomandibular joints of dogs, Schultz observed, at necropsy, normal joint cavities with firm fibrous capsules. For clinical use a 2 cc. syringe with a 26 gage, 1½ inch long, bevel steel needle is used. As the patient moves the mandible the path of the condyle is palpated. A mouth prop is placed to prevent involuntary closure. With the index finger in the lower half of the depression the needle is inserted just above the finger and directed superiorly and mesially until the wall of the glenoid fossa is contacted. Inject slowly 0.5 cc. of the solution. Even though the condition is unilateral, injections are usually made bilaterally. It is not desirable to give more than four or five series of injections at intervals of one to two weeks. The severity of the postinjection symptoms seems to show a fairly constant relation to the degree of resultant benefit. After the injections have been completed, it is advisable to check the occlusion and correct it if there has been any change brought about by the previous treatment. The author reports 75 per cent cures with no complications.

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*THE EVANSTON DENTAL CARIES STUDY. VI. A COMPARISON OF THE PREFLUORIDE WITH THE POSTFLUORIDE CARIES EXPERIENCE OF 6-, 7-, AND 8-YEAR-OLD CHILDREN IN THE STUDY AREA (EVANSTON, ILL.), *I. N. Hill, J. R. Blayney and Walter Wolf, Chicago, p. 534*

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THE PATHOGENESIS OF DESQUAMATIVE GINGIVITIS: A DISTURBANCE OF THE CONNECTIVE TISSUE GROUND SUBSTANCE

M. B. Engel, H. G. Ray and B. Orban.

Some of the intimate changes in desquamative gingivitis were studied using histochemical methods. Gingival biopsies were made on tissues obtained from 8 patients with desquamative gingivitis, of whom 6 were women. A comparable control series was also studied.

The tissues were immediately fixed by the freezing-drying method. After dehydration they were infiltrated with paraffin and sectioned. Following removal of the paraffin some sections were denatured in alcohol; others were denatured in alcohol and then extracted with water or extracted with water and then denatured. The sections were then stained for carbohydrate-containing substances by the periodic acid-leucofuchsin procedure.

The connective tissue ground substance was profoundly altered; large portions of it were dissolved; the basement membrane was either gone or attenuated. When compared to normal tissues the ground substance was shown to contain increased quantities of water soluble glycoprotein and alcohol insoluble, water soluble glycoprotein residues. In some areas the cementing substance between the epithelial cells was dissolved. It is proposed that these changes are due in part to the production of abnormal quantities of enzymes by the connective tissue cells which depolymerize the ground substance and cementing substance. The possible influence of the female sex hormones on the enzymatic activity of the connective tissue cells is considered.

STUDIES IN THE REGENERATION AND REATTACHMENT OF THE SUPPORTING STRUCTURES OF THE TEETH. I. SOFT TISSUE REATTACHMENT

W. J. Linghorne and D. C. O'Connell.

A survey of the literature reveals a sharp cleavage of opinion on the possibility of functional regeneration and reattachment of the supporting structures of the teeth after these tissues have been lost during the course of periodontal disease. In dogs with healthy supporting structures, reattachment of the gingival tissues was secured where the detachment of the soft tissues and loss of alveolar bone was effected by surgical means. The connective tissue of the gingiva was reattached by the formation of new cellular cementum on the denuded and scaled root surface. New cementum was laid down on the old cementum or directly on dentin. Uneven resorption of both cementum and dentin appeared to have taken place prior to cemental apposition. A new cementoblast layer could be discerned by approximately the sixteenth day, appearing first at the base of the lesion. Only in those cases where connective tissue reattachment failed did the oral epithelium proliferate rootwise forming an epithelialized pocket. What appeared to be the regeneration of a small amount of alveolar bone was observed in many of the sections where reattachment was secured.

THE OXYGEN CONSUMPTION OF HEALING GINGIVA

Irving Glickman, Samuel Turesky and John H. Manhold.

A correlated histological and manometric (Warburg technic) study was conducted of gingival tissue in various stages of healing following gingivectomy. The marginal gingiva in four areas in each of 17 dogs was removed and the histological picture and oxygen consumption determined. Healing gingival tissue subsequently removed from the same areas at intervals up to 64 days after the initial operation was similarly studied. The findings indicated the following: (1) The QO_2 of the normal gingiva of the dog (1.3 ±

0.07) is comparable to that of the human (1.6 ± 0.37). (2) Oxygen consumption in different stages of healing following gingivectomy varies in accordance with the nature of the microscopic tissue changes. (3) Oxygen consumption is elevated in the course of gingival healing until the maximum QO_2 (5.4) is reached at the fourteenth postoperative day. From the fourteenth to the twenty-first day, there is a decline in QO_2 to approximately the level of normal gingiva.

(4) The assumption that the artificial introduction of oxygen would hasten appreciably the normal cellular processes in the course of gingival healing is discouraged.

BACTERIAL GROWTH AND CRYSTAL FORMATION: A POSSIBLE FACTOR IN CALCULUS FORMATION

Henry A. Bartels.

The metabolic activity of oral actinomycetes in decomposing proteins resulted in increased alkalinity and ammonia liberation. The ammonia combined with magnesium and phosphate components of the medium to produce crystals of ammonium magnesium phosphate. The *in vitro* formation of such crystals by oral actinomyces substantiates Naeslund's theory of salivary calculus formation.

PHYSIOLOGICAL TOOTH MIGRATION AND ITS SIGNIFICANCE FOR THE DEVELOPMENT OF OCCLUSION. IV. THE BIOGENESIS OF OVERBITE

L. J. Baume.

The development of overbite was surveyed in 52 dentitions of children 5 to 10 years of age. It was found that the degree of incisal overbite primarily was determined by the extent of mandibular forward growth which occurred during the eruption of the lower permanent incisors and later of the permanent cuspids and bicuspids. A lessened forward extension of the lower arch as compared with the upper one was responsible for a greater incidence of severe overbite in the mixed dentition. The deciduous overbite was also a determining factor in that the slight overbite became deeper. The definite overbite of the permanent dentition finally depended upon the eruption sequence of the permanent cuspids and bicuspids. If in the lower arch the sequence was cuspid, first bicuspid, second bicuspid and in the upper arch first bicuspid, cuspid and second bicuspid, the best results were observed. Incisal overbite developed independently of the mechanism of molar adjustment. In conclusion the evidence of these four developmental studies shows that teeth and alveolar process are a genetic entity. Differentiation between general growth of the facial skeleton and that of the alveolar process is conducive to a better understanding of the etiology of malocclusion and the development of certain paradentopathies.

MASTICATORY PERFORMANCE AND EFFICIENCY

Richard S. Manly and Louise C. Braley.

A method has been devised for measuring masticatory performance and efficiency. The masticatory performance was based on the percentage of masticated peanuts which would pass through a 10-mesh screen after being subjected to 20 masticatory strokes. Efficiency was calculated from the number of chews required to reach a desired degree of food pulverization. The performance was found to be independent of the size of mouthful as long as the number of chews was kept constant, and the chewing performance of uninstructed subjects approached that obtained when mastication was confined to their best half dentition.

The particle size distribution was linear when the data was plotted on logarithmic probability paper. As mastication proceeded the process gradually became selective in that larger particles disappeared more rapidly than would be expected on the basis of random grinding.

The average performance of 25 cases with complete dentitions was 88 per cent. Fifty half dentitions lacking the third molar averaged 78 per cent. Twenty-five half dentitions which possess two bicuspids and one molar in occlusion had a mean performance of 55 per cent, and 30 denture cases averaged 35 per cent.

ELECTRICAL ACTION CURRENTS DURING MASTICATION. MEASUREMENT OF THE EFFORT EXERTED IN CHEWING VARIOUS FOODS

H. H. Neumann.

By means of the electromyogram, the energy produced during chewing was measured. On photographs of the action currents, the amplitude of oscillation was read directly in millivolts.

Differences in chewing habits can generally not be established by history taking. Most individuals consider that they chew a normal amount, though the vigor of mastication varies extremely. Objective analysis and measurement can portray the chewing habits and the functional values of various foods.

Most of the modern staple foods require little mastication not from the angle of duration but of intensity of the chewing action. This fact has been brought in causal relationship to a possible regressive process in the protoplasmatic component of the enamel and dentin, involving a change from immunity to susceptibility to bacterial invasion, and leading ultimately to dental caries.

The foods that require more mastication were found to be well baked bread crust, undercooked rice, mature coconut meat, and, particularly, sugar cane. Contrary to common belief, toast, biscuit, chewing gum, raw vegetables and fruits require little chewing if the vigor and not duration of mastication is under scrutiny.

HYGROSCOPIC EXPANSION OF SOME CASTING INVESTMENTS

N. Landgren and F. A. Peyton.

This study was designed to determine the hygroscopic expansion of inlay investments in common use. Since it was desired to study these materials under practical conditions, the casting ring and dial gage method for determining expansion was used. The expansion was measured by the dial gage placed in contact with the microscope cover slide on top of the specimen. The dial gage was counterbalanced to reduce the pressure on the specimen.

The results of this study indicate that when the investment is immersed before the initial set the greatest expansion occurs and the results are most uniform. There is a slight increase in expansion when two asbestos liners are used in the ring instead of one, and casting investments designed for hygroscopic expansion give more uniform results than those designed for thermal expansion. Hygroscopic expansion decreases with the increased time between mixing and immersion when immersion is made after the initial set. The temperature of the water bath affects the expansion slightly when the investment is immersed after the initial set and the higher temperatures of bath give increased expansion. Some investments have expansion values modified more than others by differences in temperature of the water bath and water-powder ratio.

CLINICAL OBSERVATIONS ON A CONTRACTING AMALGAM ALLOY

R. E. McDonald and R. W. Phillips.

The purpose of this study was to determine whether a slight contraction in amalgam restorations could be observed clinically. The contraction was exaggerated by use of a special high tin content alloy (32 per cent) which contracted 30 microns with the manipulative technic employed. Sixty restorations were placed in the permanent teeth of 32 child patients who were between the ages of 8 and 15. Of this number, all but six of the restorations were examined periodically with 34 being in service for at least three years. There was no clinical evidence of contraction indicated, by open or carious margins, in any restoration. The results of this study seem to indicate that there is no deleterious clinical effect from the lesser degree of contraction that might be produced from slight overtrituration of an accepted amalgam alloy.

LOW TEMPERATURE POLYMERIZATION OF ACRYLIC RESINS

P. B. Taylor and S. L. Frank.

This paper is a progress report of some studies of self-curing acrylic resins. The nature of the mechanism of polymerization and the relationship of discoloration to the activated polymerization was discussed.

The number average molecular weight of self-curing acrylics was found to be lower than the normally processed acrylics. The reason for the lower number average molecular weight was due to the increased amount of free monomer in the polymerized resin, as well as a marked decrease in the degree of polymerization.

Transverse tests show the self-curing resins to have a lower strength and a somewhat increased flexibility. Dimensional changes were observed under prescribed conditions in order to obtain an indication of the amount of shrinkage due to polymerization and subsequent expansion incident to water sorption under conditions which might simulate an oral application. A net shrinkage in a neighborhood of 0.15 per cent might be a reasonable anticipation.

THERMAL CONDUCTIVITY OF DENTIN

V. F. Lisanti and H. A. Zander.

In order to determine thermal conductivity of dentin an apparatus designed to measure

the thermal conductivity of small samples was constructed. The apparatus consists of two copper rods (thermodes), the same diameter as the specimens mounted with spring tension for alignment and contact. One of the thermodes serves to introduce heat into the system and the other to remove heat. Thermocouples were placed at 1 cm. intervals along the thermodes. Temperature readings from the thermocouples permitted calculation of the amount of heat flowing through the thermodes and sample. With this apparatus the thermal conductivity of human dentin was found to be 2.29×10^{-3}.

THE CITRIC ACID CONTENT OF HUMAN TEETH

I. Zipkin and K. A. Piez.

Data on the citric acid content of the hard tissues, and particularly the teeth, are very meager. An investigation was therefore instituted on the citric acid content of the dentin and enamel of sound and carious human teeth. Sixty-five samples of sound dentin had an average citric acid content of 888 ± 103 mg. per cent, 129 samples of carious dentin had 872 ± 105 mg. per cent, 39 samples of sound enamel had an average citric acid content of 100.5 ± 22.9 mg. per cent, and 83 samples of carious enamel had 98.7 ± 26.3 mg. per cent. The citric acid content of dentin and enamel of human teeth does not appear to be related to either caries or to tooth type.

THE LOCATION OF THE GLYCOLYTIC ENZYMES IN SALIVA

Leo M. Sreebny, E. R. Kirch and R. G. Kesel.

An experiment to determine the location of the glycolytic enzymes in the whole saliva has been described. Evidence is presented which indicates that the enzyme systems of the saliva which produce glycolysis are intracellular, that is, are to be found mainly in the microorganisms of the mouth.

THE EFFECT OF PARTLY SYNTHETIC DIETS ON THE DENTAL CARIES INCIDENCE IN SYRIAN HAMSTERS

Frank J. Orland, Elizabeth S. Hemmens and R. W. Harrison.

Based on the assumption that certain oral bacteria are important in the development of dental caries, this investigation concerned itself with the environment of the oral cavity in the hamster (*Cricetus auratus*). The factors considered were: (a) the nutritional substrate provided by the ingested food; (b) the caries-promoting bacterial flora subsisting on this substrate, and (c) the molar teeth subjected to carious destruction presumably by the action of these bacteria. Partly synthetic diets containing vitamins in measured amounts, with one or two of them omitted from each test diet, were fed to 682 hamsters distributed into 18 different dietary groups. The animals were provided with adequate amounts of the missing vitamins for their own nutrition by intraperitoneal injection. The amount of dental caries in the hamsters' molar teeth was evaluated as a plausible measure of the degree to which caries-promoting bacteria were retarded or accelerated in their growth and metabolic activities. The trends observed to have some significance were the following: With vitamin K absent from the diet, hamsters showed the greatest amount of dental caries. When choline was absent, twice as much tooth decay developed as in control groups, whereas omission of nicotinic acid resulted in half as much caries as in control animals. A 50 per cent decrease in dental caries was observed when dextrin was substituted for sucrose in the basal diet.

PRELIMINARY STUDIES OF THE CARIES INHIBITING POTENTIAL AND ACUTE TOXICITY OF SODIUM MONOFLUOROPHOSPHATE

Kanwar L. Shourie, John W. Hein and Harold C. Hodge.

When administered at a level of 40 ppm of fluoride in the drinking water of Syrian hamsters, sodium monofluorophosphate and sodium fluoride caused comparable and nearly maximal reductions in the destruction of tooth substance by dental decay. Sodium monofluorophosphate was found to be 7 to 8 times less toxic in 200 to 300 gram rats than was sodium fluoride. Calculated on the basis of fluoride content the complex fluoride is 2.5 to 3 times less toxic than the free ionic form. In view of the fact that the monofluorophosphate complex was apparently not appreciably hydrolyzed in the animal body, one may infer that fluorine does not have to be in a free ionic form to inhibit dental decay in the Syrian hamster.

THE EVANSTON DENTAL CARIES STUDY VI: A COMPARISON OF THE PREFLUORIDE WITH THE POSTFLUORIDE CARIES OF 6-7- AND 8-YEAR-OLD CHILDREN IN THE STUDY AREA (EVANSTON, ILL.)

I. N. Hill, J. R. Blayney and Walter Wolf.

The present report compares the prefluoride caries experience of the 6, 7 and 8 year old Evanston school children with the caries experience of the same age group who were examined 12 to 22 months following the fluoridation of the communal water.

The data have been analyzed by approved statistical methods. The postfluoride period showed: (1) an increase in the caries experience for deciduous teeth of the 6 and 8 year old children; (2) an overall lowering of the decayed, missing and filled rate for all permanent teeth, as well as a reduction in the caries experience of occlusal surfaces of first permanent molars; (3) an increase in the number of occlusal surfaces of first permanent molars free from caries or fillings except in the 6 year old group; (4) a reduction in the caries rate for maxillary and mandibular permanent teeth; (5) a reduction in the number of precarious lesions.

The authors conclude that these data indicated a reduction in the caries prevalence in the permanent teeth of the 6, 7 and 8 year old school children and that the effect may be assumed to be greater on the permanent teeth than on the deciduous teeth.

VARIABILITY IN DENTAL CARIES EXPERIENCE AND ITS IMPLICATION UPON SAMPLE SIZE

James M. Dunning.

Accurate epidemiologic work in the caries field requires not only common sense evaluation of the accuracy of dental examinations but statistical appraisal of variations which cannot be eliminated. Examining errors are discussed and illustrated. The use of a value for standard deviation is demonstrated in testing the significance for a difference between mean values for dental caries experience (DMF teeth or surfaces). Several examples of standard deviation are given, where even in relatively homogeneous samples the standard deviations are between 4 and 5 DMF teeth per person once the majority of the permanent teeth have been present in the mouth for a few years. Where deviations of this sort exist, large samples are needed in order to reduce the probability of chance occurrence of wide differences between means. A formula for minimum sample size is derived and illustrated for use where certain content values can be roughly predicted. A method for testing the significance of a difference between proportions is also illustrated. Data in terms of proportion are shown to be less descriptive in certain ways than data in terms of mean values per person.

INTRAVITAL UPTAKE OF FLUORIDES BY THE TEETH UNDER VARIOUS CONDITIONS

P. Adler, J. Straub and M. Popovics.

One lower bicuspid on each side was separated from the oral cavity by a thin rubber balloon. The latter was filled with a NaF solution. Fluoride concentration was determined in the original NaF solution, and after exposure of the tooth for various periods (5 to 20 minutes). The total loss of F was computed and was regarded as being taken up by the tooth if a neutral NaF solution was used. Bilateral pairs of teeth showed equal uptake under identical conditions. Prophylaxis prior to fluorine treatment increased the uptake considerably. Increasing the amount and concentration of F in the solution had under the conditions of the experiments, no effect upon the quantity of F taken up by the teeth. Longer exposure to the NaF solution resulted in an increased uptake. The F loss in an acidulated NaF solution, pH 4,0, was considerably greater than in a neutral one. It could not be determined whether or not F was taken up by the enamel. No precipitation of CaF_2 with dissolved Ca-ions occurred. Uptake in persons below 18 years of age was considerably greater than in persons over 20 years old. Between DMF index and F uptake there was a demonstrable connection.

ELECTRON MICROSCOPY OF HUMAN DENTIN

David B. Scott and Ralph W. G. Wyckoff.

It has been demonstrated previously that, in the course of preparing collodion replicas of dentin for electron microscopy, dentinal fibers often withstand the agents used in processing, and remain in place on the replicas. By slightly changing the procedures in pre-etching specimens and in the dissolution of the slabs of dentin from the replicas, it has been possible to study further the fibrous components of

dentin. Electron micrographs are presented which show the large, thin-walled dentinal (Tomes') fibers, collagenous fibrils of the matrix and very fine fibers of unknown character.

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Titles marked with an asterisk are reviewed below.

*A STUDY OF THE SIMULTANEOUS OCCURRENCE OF ENTEROCOCCI, LACTOBACILLI, AND YEASTS IN SALIVA FROM HUMAN BEINGS, *N. B. Williams, M. A. Forbes, E. Blau and C. F. Eickenberg, Philadelphia, p. 563*

MORPHOLOGIC INSTABILITY OF ACTINOMYCETES ASSOCIATED WITH ENAMEL, *Valerie Hurst, San Francisco, p. 571*

*EFFECT OF CERTAIN HENDECYNOIC ACIDS AND THEIR AMMONIUM SALTS ON ACID PRODUCTION IN SALIVA CONTAINING GLUCOSE, *J. C. Forbes, C. D. Cox and J. D. Smith, Richmond, Va., p. 583*

*THE PRODUCTION OF ACIDS FROM GLUCOSE BY ORAL MICROORGANISMS: CITRIC ACID, *Isaac Neuwirth, with the technical assistance of Julius K. Lugovoy, New York, p. 589*

*THE INHIBITION OF ACID FORMATION IN THE MOUTH BY AMINO DERIVATIVES OF 2,3-DICHLORO-1,4-NAPHTHOQUINONE, *J. C. Calandra and Ernest C. Adams, Jr., Chicago, p. 593*

*INVESTIGATIONS ON THE METABOLISM OF FLUORIDE. II. FLUORIDE CONTENT OF BLOOD AND URINE AS A FUNCTION OF THE FLUORINE IN DRINKING WATER, *Frank A. Smith, Dwight E. Gardner and Harold C. Hodge, Rochester, N. Y., p. 596*

*VIBRATION CHARACTERISTICS OF THE ROTATING DENTAL INSTRUMENT, *E. E. Henry and F. A. Peyton, Ann Arbor, Mich., p. 601*

*MEASUREMENTS OF VERTICAL DIMENSION OF PROCESSED DENTURES, *Naomi S. Steck, Pittsburgh, p. 616*

*PERMEABLE STRUCTURES IN NORMAL ENAMEL, *M. T. Jansen and J. B. Visser, Utrecht, Netherlands, p. 622*

*THE GRINDING OF VERY THIN SECTIONS OF ENAMEL, *M. T. Jansen, Utrecht, Netherlands, p. 633*

*THE PREVALENCE, DISTRIBUTION, AND MORPHOLOGIC CHANGES OF THE EPITHELIAL REMNANTS IN THE MOLAR REGION OF THE RAT, *F. M. Wentz, J. P. Weinmann and I. Schour, Chicago, p. 637*

A STUDY OF THE SIMULTANEOUS OCCURRENCE OF ENTEROCOCCI, LACTOBACILLI AND YEASTS IN SALIVA FROM HUMAN BEINGS

Ned B. Williams, M. A. Forbes, E. Blau and C. F. Eickenberg

Interest in the frequency of occurrence of enterococci in the salivas of persons of all ages was stimulated by the isolation and identification of a strain of *Streptococcus faecalis* from a culture obtained from an infected root canal. The salivas were collected in the morning just after arising. The presence of enterococci was indicated by growth and acid production after inoculation and incubation at 45° C. of a broth containing sodium azide, glucose, and bromthymol blue. All positive tubes were studied further for isolation and identification of the microorganisms. Quantitative determinations of lactobacilli and yeasts were made by inoculating tomato juice agar (pH 5.0) with dilutions of the same salivary samples. *Str. faecalis, Str. liquefaciens,* or *Str. zymogenes* were identified from 45 of 206 children and adults varying in age from 4 through 40 years. Enterococci were isolated slightly more often and more consistently from salivas obtained from the 14 to 20 year age group than from the 4 to 13 year age group and 21 years and over. Lactobacilli were found on almost every occasion, but yeasts did not appear with as great regularity. A comparison of the numbers of lactobacilli in the salivas positive for enterococci with those in negative salivas showed that the mean number of lactobacilli in positive salivas was greater than the mean number in negative salivas. A statistical analysis of these data indicated that the difference between these means was significant. Enterococci could be isolated from 14.2 per cent of positive cultures from infected root canals and in many instances these organisms could be simultaneously isolated from the saliva.

EFFECT OF CERTAIN HENDECYNOIC ACIDS AND THEIR AMMONIUM SALTS ON ACID PRODUCTION IN SALIVA CONTAINING GLUCOSE

J. C. Forbes, Charles D. Cox and J. Doyle Smith

It is shown that 2-,6-,9-, and 10-hendecynoic acids and their ammonium salts inhibit the production of acid in saliva containing glucose. When the concentrations in terms of the free acid were 50 mg. per 100 ml. and above the pH seldom dropped below 5 even

after a 72 hour incubation, while the pH of control tubes without inhibitor dropped, in nearly all cases, as low as 4.3 in 24 hours. Studies on the effect of 9-hendecynoic acid and its ammonium salt on the growth of, and acid production by, a pure culture of *Lactobacillus acidophilus* showed marked inhibition by relatively low concentrations of the inhibitors. Equal molecular concentrations exerted the same degree of inhibitions. 9-hendecynoic acid exerted considerable inhibitory action on fermentation by baker's yeast. Its ammonium and triethanolamine salts, although active, showed considerably less activity in this regard.

THE PRODUCTION OF ACIDS FROM GLUCOSE BY ORAL MICROORGANISMS: CITRIC ACID

Isaac Neuwirth

The various acids produced by the action of oral microorganisms on glucose are of interest in connection with the dental caries problem. In this study it is shown that citric acid is not produced when saliva is incubated with glucose. Indeed, it was found that added citrate, or that originally present in saliva, is rapidly utilized by oral microorganisms.

THE INHIBITION OF ACID FORMATION IN THE MOUTH BY AMINO DERIVATIVES OF 2,3 DICHLORO-1,4-NAPHTHOQUINONE

J. C. Calandra and E. C. Adams, Jr.

A number of amino derivatives of 2,3 dichloro-1,4-naphthoquinone were prepared and tested for inhibition of acid formation. It was found that all the compounds were good inhibitors. The greatest inhibition was obtained with the sulfonamide derivatives.

INVESTIGATIONS ON THE METABOLISM OF FLUORIDE. II. FLUORIDE CONTENT OF BLOOD AND URINE AS A FUNCTION OF THE FLUORINE IN DRINKING WATER

F. A. Smith, D. E. Gardner and H. C. Hodge

A comparison has been made of blood and urinary fluoride concentrations in two populations whose water supplies contained 0.06 and 1.36 ppm fluoride respectively. As the fluoride concentration of the water supply is increased from 0.06 to 1.36 ppm (twenty-three fold increase), the average urinary fluoride concentration increases from 0.06 to 1.12 ppm (nineteen fold increase). The average blood fluoride concentration increased three-fold, from 0.014 to 0.040 ppm. A maximum blood fluoride concentration of 0.1 ppm was found for each population. It was concluded that the higher concentration of fluoride in the water supply does not produce dangerously high blood fluoride concentrations.

VIBRATION CHARACTERISTICS OF THE ROTATING DENTAL INSTRUMENT

E. E. Henry and F. A. Peyton

This is a study of the comparative vibrations produced by standard dental equipment using accepted cutting instruments which are operated at speeds and pressures considered normal for such equipment. In addition to the vibration characteristics of the conventional rotating dental instrument, a brief description of the vibration resulting from the use of gas-propelled abrasive in cavity preparation is given.

From the study it was found that the fundamental vibration wave has occurred at the speed of rotation of the handpiece shaft and that it changes with operating speed. The fundamental vibration wave which is larger than any harmonic is modified by different speeds and pressures, as well as by the choice of cutting instrument employed. In general, the amplitude of the fundamental vibration tended to decrease as the pressure was increased, when the bur was driven in the forward direction. When operated at light pressures, there is a tendency for the amplitude of vibration to decrease as the speed is increased. Slower speeds and lighter pressure generally give the larger amplitude to the fundamental vibration. A tendency is shown for larger bur sizes to produce greater vibration characteristics.

MEASUREMENTS OF VERTICAL DIMENSION OF PROCESSED DENTURES

Naomi S. Steck

A description is given of an original testing device and technic for measuring changes in vertical dimension of denture base materials, and the effects of such changes in the over-all vertical dimension of the processed dentures. Included in the study are the effect of the shape factor of the denture, the shape factor of the teeth, excessive pressure during packing of the denture, the effect of remaining fin or flash, and the effect of using both compression and injection methods of processing.

This device and method can be used for testing this property of change in vertical dimension to a high degree of accuracy in other denture base materials and technics.

PERMEABLE STRUCTURES IN NORMAL ENAMEL

M. T. Jansen and J. B. Visser

The permeability of the enamel of deciduous and permanent teeth of dogs was investigated *in vivo* by means of the application of dyestuff on the intact outer surface.

As accumulations of dye cannot always be distinguished from diffraction lines, a fluorescent dye was chosen and observations were made with the fluorescence microscope. A freezing-drying technic and embedding in methyl methacrylate were employed in order to avoid postmortal displacement of the dye. Prism sheaths, lamellae and tufts were found to convey the dye from the outer surface to the dentinoenamel junction and beyond. This was accomplished within a few minutes in the case of the deciduous cuspids.

No unknown pathways were observed, but the permeability of the prism sheaths, lamellae and tufts was shown to exist under physiologic conditions. The limitations of the method and of its results were discussed.

THE GRINDING OF VERY THIN SECTIONS OF ENAMEL

M. T. Jansen

A new apparatus for the grinding of very thin sections of enamel consists of a rotating bronze lap charged with diamond powder and a reciprocating object carrier adjustable with a micrometer. The sections ground are enclosed in a piece of methyl methacrylate which fits into the object carrier. The apparatus is capable of grinding sections as thin as 0.005 mm. in areas approximately 0.1 by 0.1 mm.

THE PREVALENCE, DISTRIBUTION AND MORPHOLOGIC CHANGES OF THE EPITHELIAL REMNANTS IN THE MOLAR REGION OF THE RAT

Frank M. Wentz, J. P. Weinmann and I. Schour

This investigation was based on the histologic study of the supporting tissues of the molars of 105 normal male and female albino and gray Norway rats varying in age from 75 to 1,088 days. In approximately 50 per cent of the animals, epithelial remnants were found, the incidence decreasing with age. Three morphologic types were noted: (1) A small resting type, which decreased in number with increasing age; (2) a proliferating type, which comprised the majority of epithelial remnants; (3) a differentiating type, which increased in number with increasing age and was correlated to resorption of the interdental alveolar septum. The majority of the epithelial remnants were found in the interdental area above the normal alveolar crest. It may be assumed that the three morphologic types represented successive stages in the life history of the epithelial remnants. The small resting type, upon proliferation, became transformed into the proliferating type. The latter, particularly when stimulated by traumatic factors, may transform into the third type. While the great majority of epithelial remnants are derived from Hertwig's epithelial sheath, some might originate from the epithelium of the gingiva or from the epithelial attachment.

ORAL SEPSIS AS A SOURCE OF FOCAL IRRITATION

I. Stein. J.D.A. South Africa (Official) 5:51, February 15, 1950.

Focal infection from dental sepsis is a vast and unsolved problem. The associated phenomena are contradictory and further research is urgently needed.

A classification of 1,024 cases of systemic lesions is presented. These cases came under observation over a period of twenty years and oral sepsis was a suspected etiological factor in every case.

A new classification of dental lesions is suggested as follows: (A) the lesion constitutes a primary source of irritation; (B) the lesion constitutes a second source of irritation; (C) the lesion is an oral manifestation of a general disease.

Forty-six case reports are included to show the modus operandi of examination, diagnosis and treatment, together with the end results.

The results following the elimination of oral foci in 1,024 cases show that in 80.15 per cent the effect was nil, in 13.67 per cent improvement was noted and in 5.18 per cent the systemic disorder was aggravated.

Focal irritation is suggested as the salient factor underlying the problem of oral sepsis in its relation to systemic disorders.

A critical survey of the literature and an extensive bibliography are included.

Donovan W. Brown

Deaths

Ackerman, Simpson, DePere, Wis.; died October 19; aged 87.

Ahrens, John H., Holt, Mich.; College of Dental Surgery, University of Michigan, 1910; died September 26; aged 75.

Anderson, Benjamin F., Atlanta, Ga.; College of Dentistry, Howard University, 1929; died October 19; aged 53.

Anthultz, Louis L., Peoria, Ill.; Cincinnati College of Dental Surgery, 1902; died October 27; aged 70.

Appel, Peter, Cheyenne, Wyo.; Dental School, Northwestern University, 1901; died October 6; aged 71.

Arnold, Charles E., Indianapolis; Indiana Dental College, 1918; died September 26; aged 59.

Aultz, Albert A., San Antonio, Texas; died October 27; aged 64.

Austin, LeRoy S., Swampscott, Mass.; Dental School, Tufts College, 1911; died August 29; aged 63.

Banigan, Thomas J., Buffalo; School of Dentistry, University of Buffalo, 1927; died October 2; aged 63.

Bauman, Edgar G., Mount Vernon, N. Y.; died September 22; aged 75.

Baumgartner, Harry J., Philadelphia; Pennsylvania College of Dental Surgery, 1892; Died September 3; aged 82.

Beegan, John J., San Francisco; College of Physicians and Surgeons, 1911; died September 16.

Bennett, Allen S., Providence, R. I.; Pennsylvania College of Dental Surgery, 1909; died October 13; aged 63.

Beste, Arnold L., Sidney, Neb.; Dental School, Northwestern University, 1917; died September 14; aged 56.

Beylin, Stanley M., Akron, Ohio; College of Dentistry, Ohio State University, 1942; died September 27; aged 32.

Bishop, Neil H., Andover, Ohio; Philadelphia Dental College, 1892; died September 1; aged 79.

Black, Michael W., Schenectady, N. Y.; School of Dentistry, University of Buffalo, 1927; died September 28; aged 53.

Blanchard, Karl E., Sterling, Ill.; School of Dentistry, Washington University, 1923; died October 24; aged 55.

Boland, John E., Northampton, Mass.; died October 21; aged 62.

Boyington, Charles B., St. Maries, Idaho; Dental School, Northwestern University, 1905; died October 9; aged 75.

Braden, Thomas R., Greenfield, Ohio; College of Dental Surgery, University of Michigan, 1900; died October 9; aged 76.

Brite, Ewing M., Joplin, Mo.; School of Dentistry, Washington University, 1898; died October 13; aged 82.

Broderick, Harold D., San Jose, Calif.; College of Dentistry, University of California, 1931; died October 20; aged 48.

Burns, Howard R., Bergenfield, N. J.; Baltimore College of Dental Surgery, University of Maryland, 1927; died October 22; aged 47.

Burt, Leonard H., Kenmare, N. D.; College of Dentistry, University of Minnesota, 1905; died October 6; aged 68.

Carley, Clarence D.; Cincinnati; Ohio College of Dental Surgery, University of Cincinnati, 1902; died October 17; aged 76.

Caswell, Frederick C.; Brockton, Mass.; Dental School; Tufts College, 1905; died October 16; aged 68.

Chandler, William E., El Campo, Texas; died September 26; aged 89.

Clarke, Howard W.; Duluth, Minn.; Chicago College of Dental Surgery, 1907; died September 8; aged 67.

Clarke, Robert S., Chicago College of Dental Surgery, 1919; died October 18; aged 56.

Clinkenbeard, A. Alonzo, Chicago; died August 1.

Cole, Herbert B., Charlotte, Mich.; Chicago College of Dental Surgery, 1894; died October 5; aged 84.

Coll, Francis B., Atlantic City, N. J.; died September 26; aged 70.

Collings, Alfred M., Cleveland; School of Dentistry, Western Reserve University, 1925; died October 17; aged 49.

Creasy, Byron H., Wilkes-Barre, Pa.; Medico Chirurgical College of Philadelphia, 1911; died September 28; aged 62.

Cromer, A. Owen, Oklahoma City; Central College of Dentistry, 1900; died October 4; aged 75.

Davis, W. Clyde, Lincoln, Neb.; College of Dentistry, University of Iowa, 1891; died October 11; aged 84.

Dean, Richard D., Memphis, Tenn.; College of Dentistry, University of Tennessee, 1922; died September 29; aged 66.

Denn, Carl F., Columbus, Ohio; College of Dentistry, Ohio State University, 1937; died September 8; aged 37.

Devine, Joseph J., New York; died September 11.

Newton, Edward P., Richmond, Texas; Texas Dental College, 1912; died August 12; aged 62.

O'Connor, Fergus, Chicago; died September 17.

O'Connor, Timothy L., Worcester, Mass.; died September 14; aged 67.

O'Hara, Thomas G., North St. Paul, Minn., Dental School, Northwestern University, 1909; died August 15; aged 65.

O'Leary, Patrick H., Chateaugay, N. Y.; College of Dental Surgery, University of Michigan, 1914; died August 8; aged 60.

Oliver, Nicholas, Asbury Park, N. J.; died August 29; aged 65.

O'Neill, Gilbert L., Fords, N. J.; Philadelphia Dental College, 1925; died September 17; aged 50.

Ormiston, Glick A., Oklahoma City; Kansas City Western Dental College, 1934; died October 11; aged 41.

Ostrem, George, Nevada, Iowa; College of Dentistry, University of Iowa, 1916; died October 7; aged 59.

Overstreet, John L., Denver; died September 6; aged 93.

Owens, John R., Cleveland; School of Dentistry, Temple University, 1875; died October 29; aged 97.

Pack, John C., Salt Lake City; Western Dental College, 1914; died October 4; aged 57.

Parker, Robert M., Portland, Ore.; School of Dentistry, University of Pennsylvania, 1907; died August 17; aged 68.

Parks, William H., Upper Darby, Pa.; School of Dentistry, Temple University, 1900; died September 15; aged 75.

Parnell, Oliver H., Chattanooga, Tenn.; Atlanta Dental College, 1897; died October 20; aged 78.

Pearce, Maynard D., Billings, Mont.; Kansas City-Western Dental College, 1934; died July 28; aged 47.

Pearce, Milton B.; New Albany, Miss.; School of Dentistry, Tulane University, 1919; died September 1; aged 49.

Peterson, John G., Zanesville, Ohio; College of Dentistry, Ohio Medical University, 1901; died August 8; aged 77.

Phillips, John S., Pittsburgh; School of Dentistry, University of Pittsburgh, 1926; died August 10; aged 51.

Pielemeier, Gottlieb A., Vincennes, Ind.; School of Dentistry, University of Louisville, 1896; died October 19; aged 78.

Piper, O. H., Ventura, Calif.; died July 22; aged 81.

Pitra, Joseph A., Cleveland; School of Dentistry, Western Reserve University, 1925; died August 28; aged 49.

Port, Charles F., Clinton, Iowa; Chicago College of Dental Surgery, 1903; died September 2; aged 70.

Poundstone, Leon H., Chicago; Dental School, Northwestern University, 1918; died September 19; aged 59.

Rairigh, Maximillian A., New Oxford, Pa.; Pennsylvania College of Dental Surgery, 1905; died September 26; aged 71.

Ralston, Samuel B., Lancaster, Pa.; School of Dentistry, University of Pittsburgh, 1908; died August 29; aged 65.

Reay, Milton F., Chicago; Chicago College of Dental Surgery, 1913; died August 17; aged 58.

Reddick, S. Alexander, Columbus, Ga.; Dental Department, Meharry Medical College, 1924; died in October; aged 52.

Reed, Charles A., Atlantic Highlands, N. J.; School of Dentistry, Temple University, 1890; died August 18, aged 82.

Rhodes, Carlton E., Oroville, Calif.; College of Dentistry, University of California, 1904; died September 19; aged 72.

Rice, Walter G., Terre Haute, Ind.; School of Dentistry, University of Louisville, 1897; died September 5; aged 76.

Richards, Claude E., Evanston, Ill.; Chicago College of Dental Surgery, 1903; died October 4; aged 70.

Rigby, Robert R., St. George, S. C.; Atlanta Dental College, 1912; died October 8; aged 62.

Roe, Frank C., Itasca, Ill.; Illinois School of Dentistry, 1900; died November 9; aged 81.

Roe, Leroy E., Norfolk, Neb.; died August 10; aged 90.

Roe, Wesley R., Philadelphia; Pennsylvania College of Dental Surgery, 1895; died July 28; aged 76.

Rule, John A., Elsie, Mich.; College of Dentistry, University of Tennessee, 1899; died October 9; aged 87.

Salvino, James T., Cicero, Ill.; Chicago College of Dental Surgery, 1929; died August 12; aged 45.

Schock, George F., Chicago; Chicago College of Dental Surgery, 1908; died November 1; aged 63.

Schulz, Stephanie, St. Paul, Minn.; College of Dentistry, University of Minnesota, 1921; died August 8; aged 51.

Scott, B. C., Winona, Miss.; College of Dentistry, University of Tennessee, 1899; died August 7; aged 80.

Schoenberger, John F., Reading, Pa.; Medico Chirurgical College of Philadelphia, 1905; died September 6; aged 71.

Scholberg, Martin H., Minot, N. D.; died September 8; aged 70.

Senior, Philip H., Redding, Conn.; died August 12; aged 68.

Shurtliff, John W., Salt Lake City; Chicago College of Dental Surgery, 1914; died September 17; aged 69.

Sipple, Julius W., Savannah, Ga.; Southern Dental College, 1915; died August 20; aged 59.

Smith, A. Fowler, Syracuse, N. Y.; School of Dentistry, University of Pennsylvania, 1892; died October 8; aged 79.

Snook, Frederick E., Golden, Idaho; died in September; aged 73.

Spearman, Walter A., Water Valley, Miss.; Atlanta Dental College, 1915; died August 11.

Spicer, Samuel S., Denver; Dental School, Northwestern University, 1906; died August 2; aged 70.

Stealey, Thomas S., Rutherford, Calif.; College of Physicians and Surgeons, 1900; died September 2; aged 85.

Stone, George, Denver; Denver College of Dentistry, 1899; died February 15.

Stoughton, Elmer B., Ohio, Ill.; College of Dentistry, University of Illinois, 1908; died July 2; aged 70.

Stuart, James A., Harrisburg, Pa.; Baltimore College of Dental Surgery, 1901; died September 21.

Stumpf, Lewis T., Madison, Ohio; School of Dentistry, Western Reserve University, 1921; died September 7; aged 54.

Svenson, Charles L. Lewiston, Me.; School of Dentistry, Temple University, 1906; died September 28; aged 64.

Sydner, Claude, Las Animas, Colo.; died August 20; aged 73.

Talley, Morgan S., Memphis, Tenn.; died August 26; aged 25.

Taylor, William E., Dover, N. J.; New York College of Dentistry, 1916; died October 6; aged 56.

Tayman, George H., Hargill, Texas; Dental Department, Marion-Sims College of Medicine, 1904; died July 3.

Tedesco, Frank E., Council Bluffs, Iowa; College of Dentistry, Creighton University, 1928; died September 1; aged 43.

Temple, Harry W., Chicago; died July 26.

Thomas, Glenn A., Riley, Kan.; Pacific Dental College, 1913; died August 14; aged 63.

Thornbury, Samuel W., Coatesville, Pa.; Philadelphia Dental College, 1898; died October 3; aged 75.

Thorold, Frederick C., Flint, Mich,; College of Dental Surgery, University of Michigan, 1915; died September 22; aged 58.

Tiller, William D., Ontario, Calif.; Marion-Sims Dental College, 1903; died August 5; aged 71.

Todd, Elmer C., Billings, Mont.; died September 25; aged 86.

Todd, Ira H., Monaca, Pa.; Pittsburgh Dental College, Western University of Pennsylvania, 1900; died October 6; aged 80.

Traynham, R. Charles, Pittsburg, Texas; Dental School, Northwestern University, 1899; died September 26; aged 80.

Trigg, Frederick W., Youngstown, Ohio; College of Dental Surgery, University of Michigan, 1917; died August 16; aged 57.

Truett, William D., St. Augustine, Fla.; Atlanta Dental College, 1915; died October 14; aged 65.

Upshur, Ferdinand S., Philadelphia; School of Dentistry, Temple University, 1928; died October 14; aged 59.

Vandeburg, Frank H., Stanton, Neb.; College of Dental Surgery, University of Michigan, 1902; died in October; aged 73.

Waesche, J. Fred., Sykesville, Md.; Baltimore College of Dental Surgery, 1895; died October 19; aged 84.

Walls, James T., Portland, Ore.; School of Dentistry, North Pacific College of Oregon, 1918; died August 7; aged 53.

Walsh, Arthur W., Bedford, Ohio; Philadelphia Dental College, 1899; died July 31; aged 72.

Walsh, Henry P., Milton, Mass.; Dental School, Tufts College, 1913; died August 26.

Waterman, Glen B., Cedar Falls, Iowa; College of Dentistry, University of Illinois, 1906; died September 9; aged 65.

Weber, Andres G., Havana, Cuba; Pennsylvania College of Dental Surgery, 1890; died November 2; aged 79.

Weld, Frank A., Belvidere, Ill.; Chicago College of Dental Surgery, 1896; died August 26; aged 80.

Westbrook, Alex, Little Rock, Ark.; died July 25; aged 83.

Wheeler, Frank L., Albany, N. Y.; College of Dentistry, University of Iowa, 1919; died October 12; aged 57.

Wible, John H., Canton, Ohio; School of Dentistry, University of Pennsylvania, 1886; died October 26; aged 88.

Wilson, Louie F., Mobile, Ala.; School of Dentistry, Vanderbilt University, 1908; died September 28; aged 64.

Winder, Willis N., Sebastopol, Calif.; School of Dentistry, St. Louis University, 1906; died October 9.

Wineberg, Leon, Chicago; Chicago College of Dental Surgery, 1918; died August 23; aged 62.

Wolf, Franklin W., Galesburg, Ill.; Philadelphia Dental College, 1885; died September 1; aged 83.

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Announcements

AMERICAN DENTAL ASSOCIATION

Ninety-Second Annual Session	Oct. 15-18, 1951	Washington, D. C.
Ninety-Third Annual Session	Sept. 8-11, 1952	St. Louis
Ninety-Fourth Annual Session	Sept. 28-Oct. 1, 1953	Cleveland

MEETINGS OF STATE SOCIETIES

State	Date	Place	Secretary	Address
Alabama	April 16-18	Birmingham	G. W. Matthews	1922 Tenth Ave., S., Birmingham 5
Alaska			C. N. Hoveland	Anchorage
Arizona	April	Tucson	H. G. DeWolf	Valley National Bank Bldg Tucson
Arkansas	April 8-11	Little Rock	D. M. Hamm	White Bldg., Clarksville
California	April 16-18	San Francisco	L. R. Ludwigsen	450 Sutter St., San Francisco
S. California	April 2-4	Los Angeles	C. A. Moss	1401 S. Hope St., Los Angeles
Colorado			R. A. Downs	724 Republic Bldg., Denver 2
Connecticut			E. S. Arnold	37 Linnard Rd., W. Hartford
Delaware	Jan. 10	Wilmington	L. Kreshtool	815 West St., Wilmington
District of Columbia	Mar. 11-14	Washington	K. H. Wood	202-1835 Eye St., N. W., Washington
Florida			L. M. Schulstad	Professional Bldg., Bradenton
Georgia			J. M. Heard, Jr.	Persons Bldg., Macon
Hawaii	Sept. 27-29	Kailua	J. H. Dawe	810 N. Vineyard St., Honolulu 17
Idaho		Lewiston	A. R. Cutler	Eastman Bldg., Boise
Illinois	May 7-10	Peoria	P. W. Clopper	623 Jefferson Bldg., Peoria 2
Indiana	May 21-23	Indianapolis	E. E. Ewbank	Kingman
Iowa	May 7-9	Des Moines	H. I. Wilson	639 Insurance Exchange Bldg., Des Moines
Kansas	May 6-9	Wichita	F. A. Richmond	Brotherhood Bldg., Kansas City
Kentucky	April 2-4	Louisville	A. B. Coxwell	1976 Douglass Blvd., Louisville
Louisiana	April 26-28	New Orleans	J. S. Bernhard	407 Medical Arts Bldg., Shreveport
Maine	June 28-30	Rockland	F. P. Gilley	31 Central St., Bangor
Maryland	May 7-9	Baltimore	E. L. Pessagno, Jr.	415 Medical Arts Bldg., Baltimore 1
Massachusetts	April 30-May 2	Boston	H. E. Tingley	12 Bay State Road, Boston
Michigan	April 16-18	Detroit	F. Wertheimer	Michigan Dept. of Health, Lansing
Minnesota	Feb. 19-21	Minneapolis	C. V. E. Cassel	242 Lowry Medical Arts Bldg., St. Paul
Mississippi	April 29-May 2	Jackson	H. M. Campbell	Tupelo
Missouri	April 1-4	St. Louis	R. R. Rhoades	201 Merchants Bank Bldg., Jefferson City
Montana	May 3-5	Billings	C. S. Renouard	304 Phoenix Bldg., Butte
Nebraska	May 14-16	Lincoln	F. A. Pierson	Federal Security Bldg., Lincoln
Nevada	June 1, 2	Reno	W. R. Bell	Medical Arts Bldg., Reno
New Hampshire			F. E. Williams	814 Elm St., Manchester
New Jersey	April 11-13	Atlantic City	J. G. Carr	407 Cooper St., Camden
New Mexico	May 21-23	Santa Fe	J. S. Eilar	First National Bank Bldg., Albuquerque
New York	May 7-11	Buffalo	C. A. Wilkie	1 Hanson Place, Brooklyn
North Carolina	April 30-May 2	Pinehurst	B. N. Walker	Liberty Life Bldg., Charlotte
North Dakota	May 17-20	Grand Forks	J. H. Lunday	Fargo
Ohio			E. G. Jones	185 E. State St., Columbus
Oklahoma	April 15-18	Oklahoma City	R. C. Calkin	109½ W. Oklahoma, Guthrie
Oregon	Mar. 3-5	Portland	H. C. Fixott, Jr.	Medical-Dental Bldg., Portland
Panama Canal Zone			L. F. Baranowski	P. O. Box 102, Ft. Kobbe
Pennsylvania	Sept. 11-14	Pittsburgh	M. D. Zimmerman	217 State St., Harrisburg
Puerto Rico			J. F. Suarez	Box 3863, Santurce
Rhode Island	Jan.	Providence	A. F. Sullivan	171 Westminster St., Providence 3
South Carolina	May 6-8	Charleston	J. R. Owings	201 E. North St., Greenville
South Dakota	May 20-22	Watertown	E. W. Elmen	Sioux Falls
Tennessee	May 7-9	Nashville	E. J. Justis	Exchange Bldg., Memphis

State	Date	Place	Secretary	Address
Texas	April 30-May 5	San Antonio	W. Ogle	510 N. Ervay St., Dallas
Utah		Ogden	B. P. McBride	Medical Arts Bldg., Salt Lake City
Vermont	May 20-22	Woodstock	J. A. Larrow	Middlebury
Virginia	April 9-11	Richmond	J. E. John	804 Medical Arts Bldg., Roanoke
Washington			C. E. Flood	1130 Medical-Dental Bldg., Seattle 1
West Virginia	July 16-18	White Sulphur Springs	A. B. Drake	508 West Virginia Bldg., Huntington 1
Wisconsin	Mar. 27-29	Milwaukee	R. A. Mason	964 N. 27th St., Milwaukee
Wyoming			T. J. Drew	State Capitol, Cheyenne

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

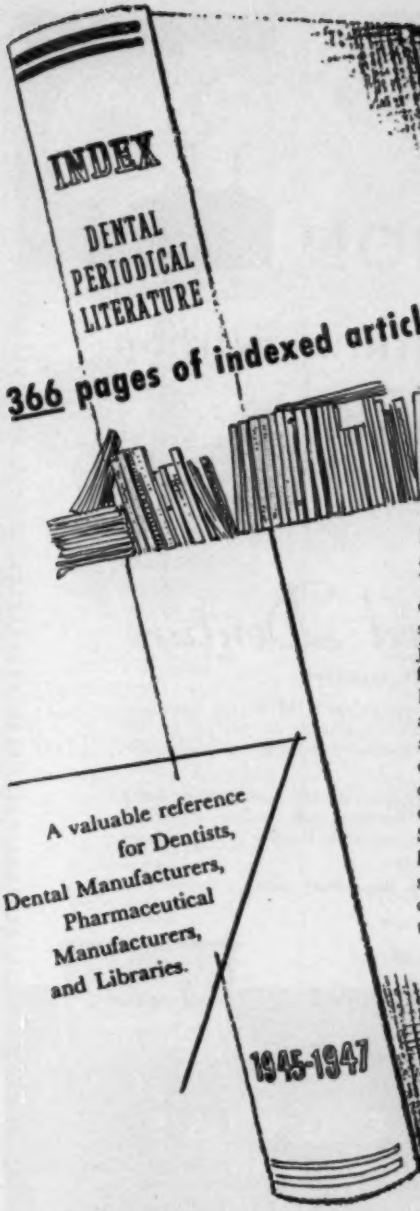
State	Date	Place	Secretary	Address
Alabama	June 18	Birmingham	M. D. Edwards	120 Adams, Montgomery
Alaska	Aug. 6-11	Ketchikan	J. H. Geyer	Juneau
Arizona			R. K. Trueblood	25 N. Second Ave., Glendale
Arkansas			H. E. Hanna	Wilson Bldg., El Dorado
California	Feb. 5	San Francisco	K. I. Nesbitt	507 Polk St., San Francisco 2
Colorado			W. D. McCarthy	724 Republic Bldg., Denver 2
Connecticut			C. G. Brooks Recorder	302 State St., New London
Delaware			P. K. Musselman	143 W. Main St., Newark
District of Columbia	Jan. 8-12	Washington	W. M. Falls	1801 Eye St., N. W., Washington 6
Florida	July 9-14*		A. W. Kellner	P. O. Box 155, Hollywood
Georgia			R. C. Coleman	State Capitol Bldg., Atlanta 3
Hawaii			H. L. Houvener	7-8 Pantheon Bldg., Honolulu
Idaho			F. L. Luce	510 First National Bank Bldg., Boise
Illinois	June 26-29	Chicago	W. A. McKee	503 Wood Bldg., Benton
Indiana			C. A. Frech	Gary National Bank Bldg., Gary
Iowa	May 21-25*	Iowa City	H. M. Willits	719 Roshek Bldg., Dubuque
Kansas			G. L. Teall	Hiawatha
Kentucky			R. I. Todd	Western Union Bldg., Richmond
Louisiana			A. R. deNux	Marksville
Maine			R. A. Derbyshire	Box 387, Skowhegan
Maryland			W. D. Day	3811 Hadley Square E., Baltimore 18
Massachusetts			J. C. Wilson	413 N. State House, Boston 33
Michigan	Jan. 28-Feb. 2	Ann Arbor	J. L. Champagne	3714 W. McNichols Road, Detroit 21
Minnesota	Jan. 8-12	Minneapolis	F. A. Larson	1632 Washington St., N. E., Minneapolis
Mississippi	Jan. 8-10	Jackson	J. C. Boswell	508 Lamar Bldg., Jackson
Missouri			R. R. Rhoades	Central Trust Bldg., Jefferson City
Montana			P. M. Feda	Box 865, Helena
Nebraska			C. A. Bumstead	924 Stewart Bldg., Lincoln
Nevada			G. C. Steinmiller	Masonic Temple, Reno
New Hampshire	June	Boston	J. B. Brown	5 N. State St., Concord
New Jersey	June 18, 19	New York††	W. A. Wilson	150 E. State St., Trenton 8
	June 25, 26	Philadelphia††		
	June 27-29	Trenton**		
New Mexico	Jan. 15-18	Santa Fe	J. J. Clarke, Sr.	Artesia
New York			D. W. Beier	23 S. Pearl St., Albany 7
North Carolina	June 25	Raleigh	F. O. Alford	1109 Liberty Life Bldg., Charlotte 2
North Dakota	July 9-12	Fargo	A. B. Crabtree	Ellendale
Ohio			E. D. Lowry	79 E. State St., Columbus
Oklahoma			N. D. Griffith	509 Medical Arts Bldg., Oklahoma City 2
Oregon			A. F. Davis Exec. Secy.	306 Public Service Bldg., Portland
Pennsylvania	May 21-23† and May 22‡	Pittsburgh	R. E. V. Miller	Northampton National Bank Bldg., Easton
	June 4-6† and June 5‡	Philadelphia		
	June 18-20† and June 20‡	Philadelphia		
	June 21-23**	Philadelphia and Pittsburgh		
Rhode Island			F. M. Hackett	State Office Bldg., Providence

State	Date	Place	Secretary	Address
South Carolina	July 4-7	Columbia	E. G. Bumgardner	1517 Hampton St., Columbia
South Dakota			R. W. Ellis	Salem
Tennessee			F. S. Maxey	804 Bennie Dillon Bldg., Nashville 3
Texas			R. T. Weber	312 Capital National Bank Bldg., Austin
Utah			J. J. Dalpias	Helper
Vermont			F. A. Reid	Windsor
Virginia	June 12	Richmond	J. M. Hughes	715 Medical Arts Bldg., Richmond 19
Washington	June 18-22	Seattle	J. B. Kiefer, Jr.	510 Cobb Bldg., Seattle
West Virginia	June 25-27	West Liberty	C. A. Laughlin	613 Prunty Bldg., Clarksburg
Wisconsin	June 18*	Milwaukee	S. F. Donovan	Tomah
Wyoming			W. J. Ryan	208 Boyd Bldg., Cheyenne

*Dentistry and dental hygiene.
†Dental clinical examinations.
‡Dental hygiene clinical examinations.
**Written examinations.
††Clinical examinations.

OTHER MEETINGS

Name	Date	City	Secy. or Chm.	Address
Academy for Plastics Research	Feb. 2	Chicago	L. W. Harris	25 E. Washington St., Chicago
Academy of Denture Prosthetics, Annual Meeting	April 30-May 6	Washington, D. C.	I. L. Furnas Secy.	928 Silverado St., La Jolla, Calif.
American Academy of Restorative Dentistry	Feb. 4	Chicago	K. A. Bignell Secy.	25 E. Washington St., Chicago
American Association of Endodontists, Annual Meeting	Feb. 3, 4	Chicago	N. W. Burkman Secy.	525 Merrill St., Birmingham, Mich.
American Association of Orthodontists, Annual Meeting	April 23-26	Louisville, Ky.	G. R. Moore Secy.	919 Oakland Ave., Ann Arbor, Mich.
American Association of Public Health Dentists	Feb. 4	Chicago	C. L. Sebelius Secy.	Tennessee Dept. of Public Health, Nashville, Tenn.
American Board of Oral Surgery	April 7-10	Chicago	L. M. FitzGerald Secy.	718 Roshek Bldg., Dubuque, Iowa
American Board of Pedodontics	Feb. 8-10	St. Louis	R. L. Ireland Secy.	305 Andrews Hall, Lincoln 8, Neb.
American College of Dentists	Feb. 4	Chicago	O. W. Brandhorst Secy.	4952 Maryland Ave., St. Louis
American Denture Society	Feb. 3, 4	Chicago	A. L. Roberts Secy.	Aurora National Bank Bldg., Aurora, Ill.
Chicago Dental Society Midwinter Meeting	Feb. 5-8	Chicago	K. S. Richardson Exec. Secy.	30 N. Michigan Ave., Chicago 2
Denver Dental Association, Midwinter Meeting	Jan. 7-10	Denver	R. R. Maier Secy.	1123 Republic Bldg., Denver 2
Greater Philadelphia, Annual Meeting	Jan. 30-Feb. 1	Philadelphia	R. Adams Secy.	710 W. York St., Philadelphia
International Academy of Anesthesiology	Jan. 17	New York	I. G. Tomack Secy.	355 E. 149th St., New York 55
International College of Dentists	Feb. 4	Chicago	E. S. Best Secy.	801 Medical Arts Bldg., Minneapolis 2
Northeastern Society of Orthodontists, Annual Meeting	Mar. 5, 6	New York	O. Jacobson Secy.	35 W. 81st St., New York
Pacific Coast Dental Conference (Eighth)	June 25-28	Seattle	C. R. Flood Secy.	605 Medical-Dental Bldg., Seattle 1
Southeastern Society of Oral Surgeons, Second Annual Meeting	Mar. 2, 3	New Orleans	G. W. Matthews Editor	1922 Tenth Ave., S., Birmingham, Ala.
Southern Academy of Oral Surgery, First Annual Convention	Mar. 24, 25	Atlanta, Ga.	R. H. Roux, Jr. Secy.	112 W. Jones St., Savannah, Ga.



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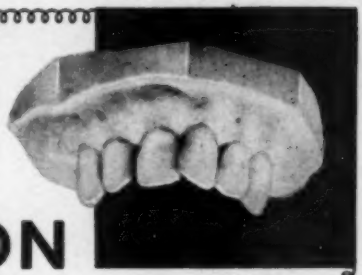

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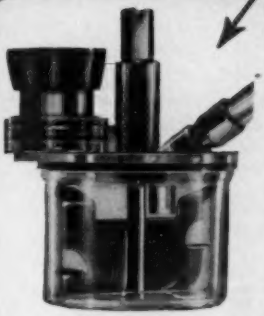

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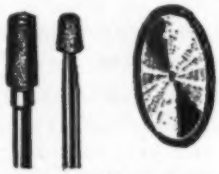

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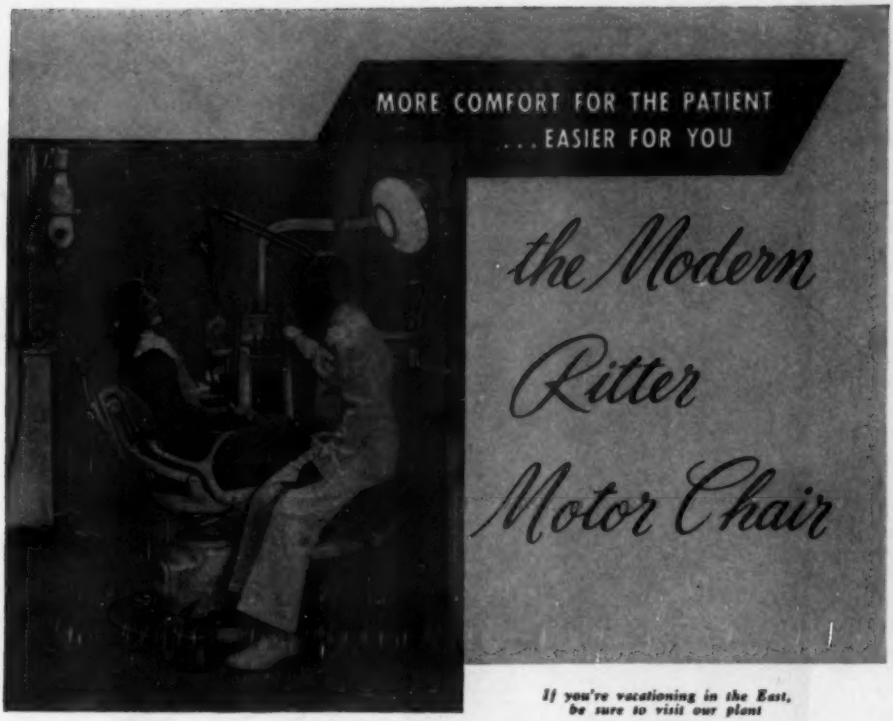

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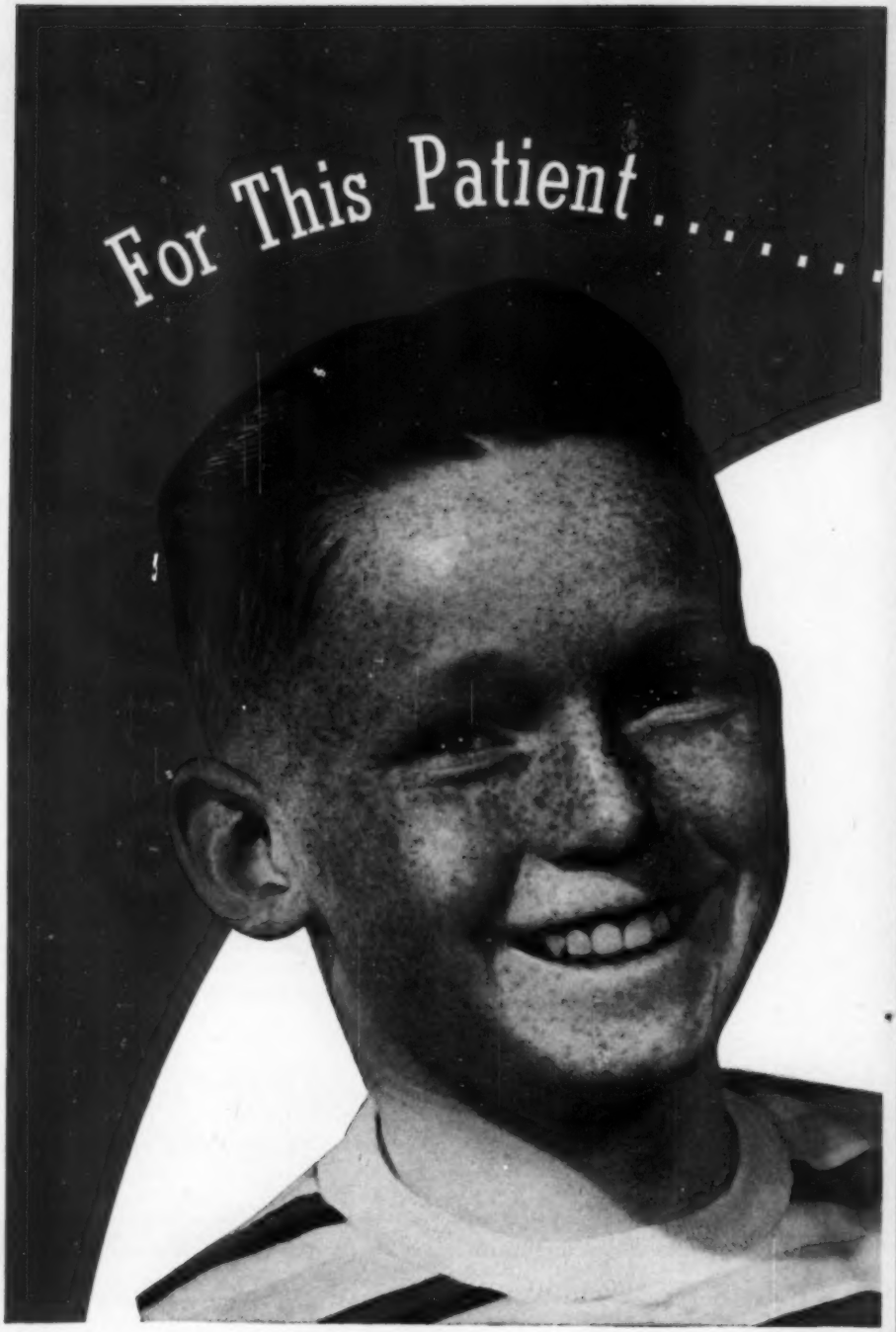
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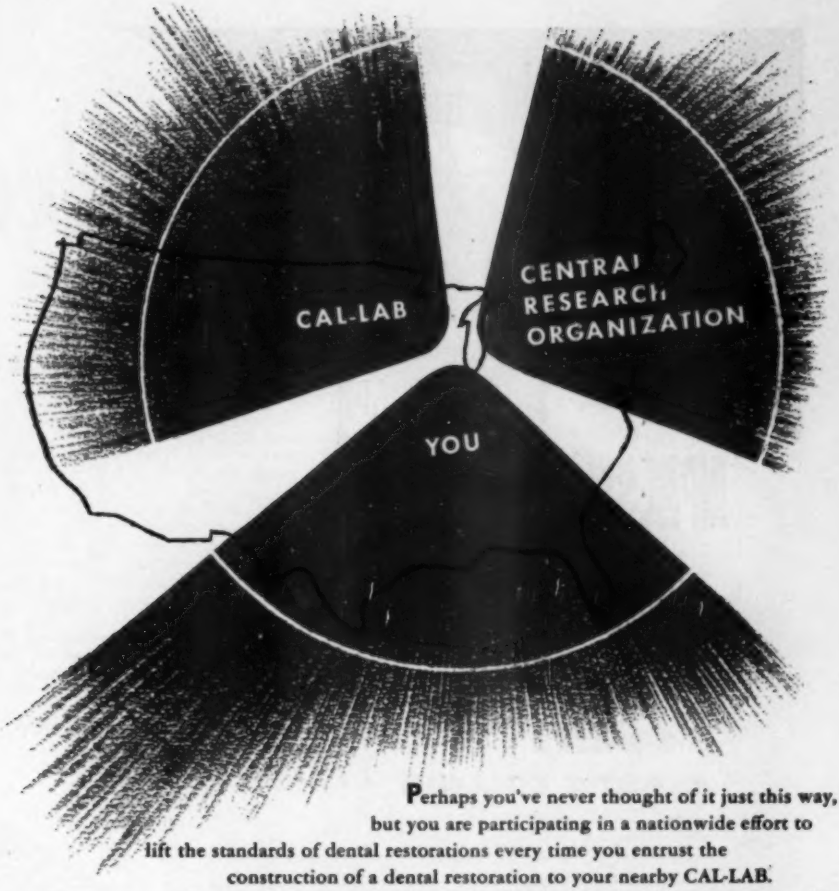

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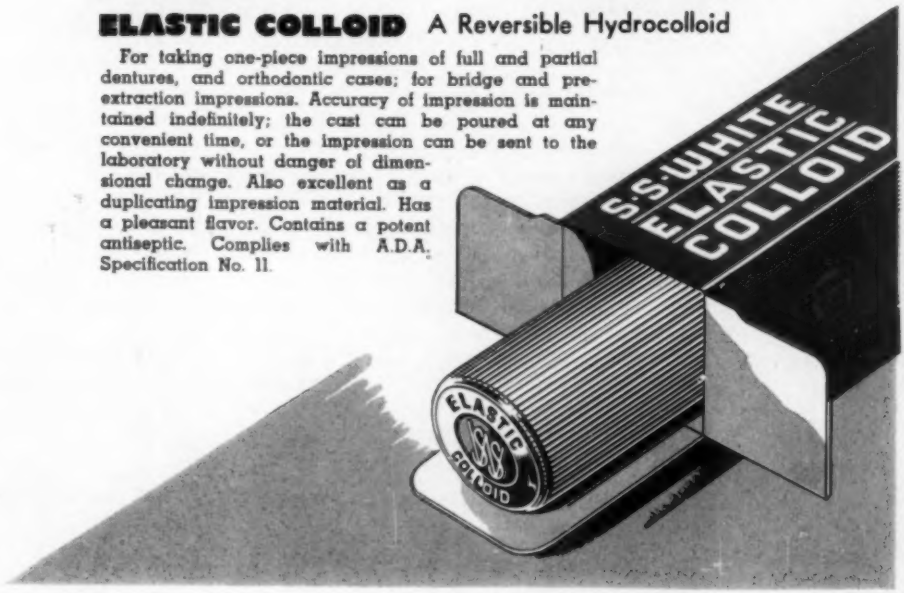

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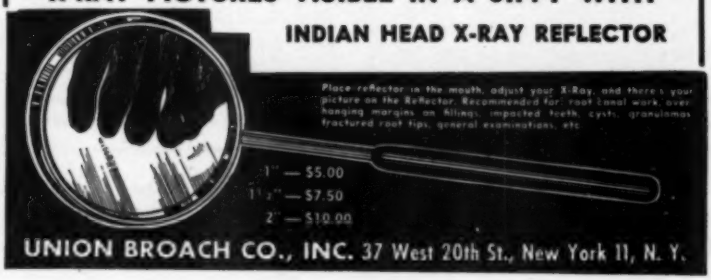
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First issue: March, 1951

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The Pacific Coast Society of Prosthodontists

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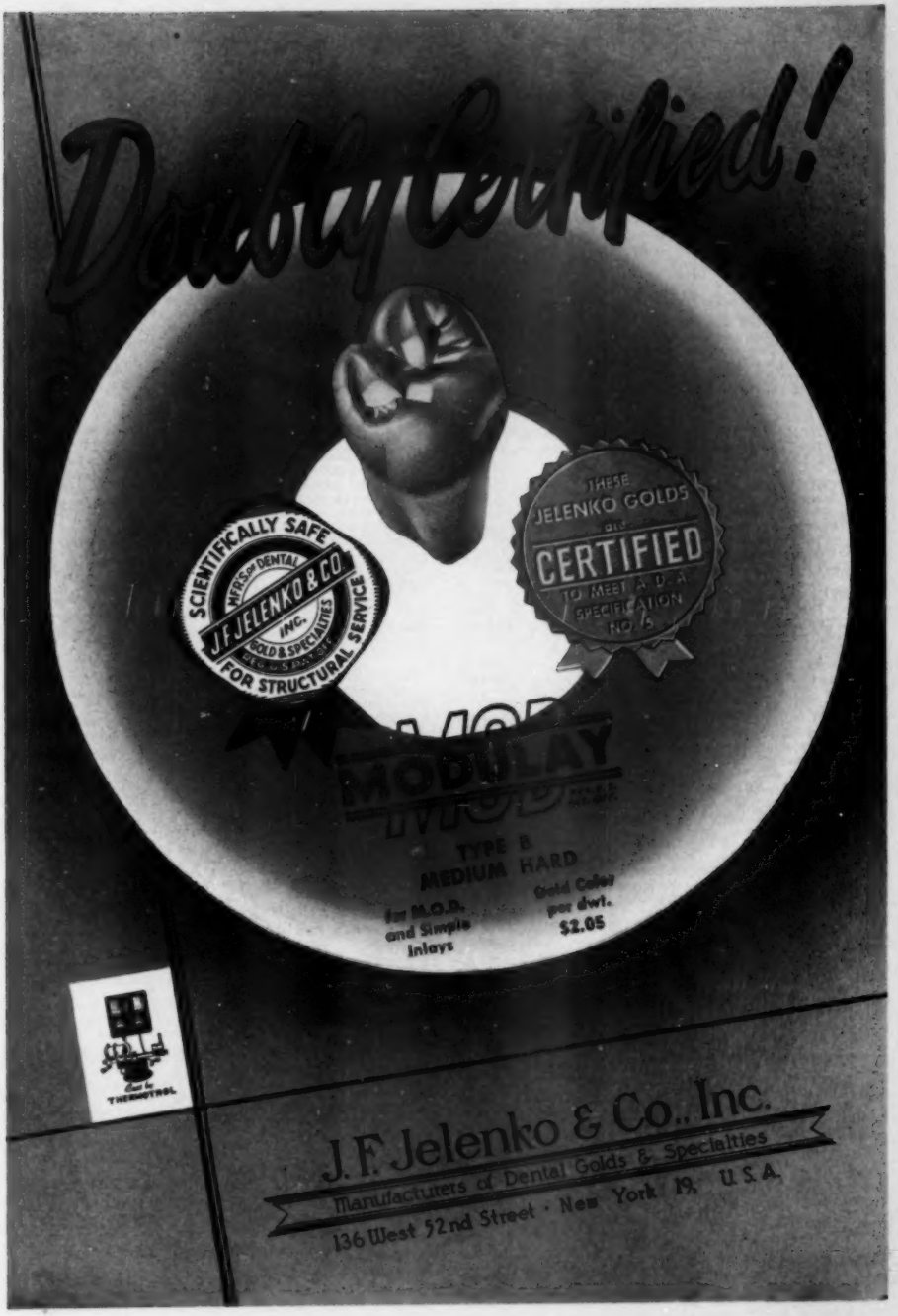
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WANTED—(a) Instructor or assistant professor, department of periodontology; should be well trained in oral histology and oral pathology with clinical experience in periodontia and possibly in root canal therapy.

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(b) General operator to join staff of dental clinic; private practice, partnership basis; no investment; commission; town of 30,000; Pacific Northwest.

•

(c) Dentist interested group practice; small clinic; Northwest Texas; $700-$1000.

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(d) General practitioner; dental department, foreign operations, one of country's leading industrial companies.

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(g) Dentist to take charge of department, well established group, near Chicago.

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(h) Pedodontist and general practitioner; group appointments, California.

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(i) General practitioner to become associated with two dentists, well established in one of South Dakota's leading cities; salary followed by partnership.

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(j) Field dentist; state health department; West.

•

(k) Pedodontist or general practitioner; four chair office; university town, New York.

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(l) Assistant dentist; state hospital; well equipped department; resort area, South.

•

(m) Illinois-licensed dentist, man or woman, for position, Chicago area, involving 20 hours weekly.

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(n) Assistant; general practice; opportunity of taking over entire practice 6-7 years; winter resort city, Arizona.

(o) General practitioner; group appointment; emphasis on pedodontics, crown and bridge; Ohio.

•

(p) Pedodontist to become associated with pedodontist well established in Michigan.

•

(q) Associate by general practitioner; slight preference for one qualified children's dentistry; college town, Illinois.

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(r) Young dentist interested in children and particularly well qualified operative dentistry to become associated with dentist well established, college town, Massachusetts; partnership possibilities.

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(s) Senior and junior dentists; state hospital; Midwest.

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(u) Assistant by dentist well established, Chicago.

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(v) School dentist; woman preferred; Indiana area.

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(w) New York licensed dentist for full time hospital appointment.

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(x) Public health dentist; administrative post; state health department; West.

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(y) Resident in oral surgery; university center, Midwest.

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(z) Dental clinician; state health department; South.

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(zz) Young dentist with two or three years' experience to become associated with dentist well established in interesting city outside Continental United States; percentage arrangement, should net $600-$700 monthly; income exempt from income tax.

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(b) Office of busy oral surgeon; college town, Pacific Northwest.

The Medical Bureau (cont'd)

(c) To assist in dental department, large hospital; duties include some teaching; Midwestern metropolis.

•

(d) To assist pedodontist and general operator; California.

•

(e) To conduct dental education program; state health department; South.

•

(f) Dental assistant by American dentist practicing in Central America.

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(a) General practice; Chicago area (North Shore suburb).

•

(b) California practice limited to oral surgery; well established.

OPPORTUNITIES WANTED

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Pedodontist; degrees, Northwestern; year's internship and year's graduate training in pedodontia.

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Prosthodontist; recently received M.S. degree in Prosthetic dentistry; has taken American Board examination; four years' general practice before specializing.

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Dentist wishes position involving exodontia; year's dental internship; graduate training in exodontia, Eastman Dental Clinic; several years' private practice.

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Wanted appointment; B.A., D.D.S., leading university; now completing three years' graduate training in Periodontia and Oral Pathology for which he will receive Master's degree; several years' teaching experience before entering dental school.

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Wanted—Academic appointment; B.S., D.D.S., Middle West university; three years, assistant professor in operative dentistry and crown and bridge, year's temporary teaching appointment during which time he has conducted graduate course in pedodontics.

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•

(b) DENTIST: Age 31, DDS St. Louis University, 3 years Naval Service in World War II, 5 years private practice. Will consider any arrangement for good operative work.

•

(c) DENTIST: Age 35, 2 years Naval Service, 4 years private practice. Now with US Public Health Service. Would like Midwest location.

•

(d) ORAL SURGEON: Age 28, single, 2 years service with Navy, graduate class A school, 2 year residency in Oral Surgery, Post Graduate work in oral surgery and anesthesia. Immediately available.

•

(e) ORTHODONTIST: Age 28, BS, DDS, MS, State University, 2 years Army service, 2½ years private practice experience.

•

(f) DENTIST: Age 33, class A school, internship, 5 years service U.S. Army, 5 years private practice, 1 year graduate work in Oral Surgery. Immediately available.

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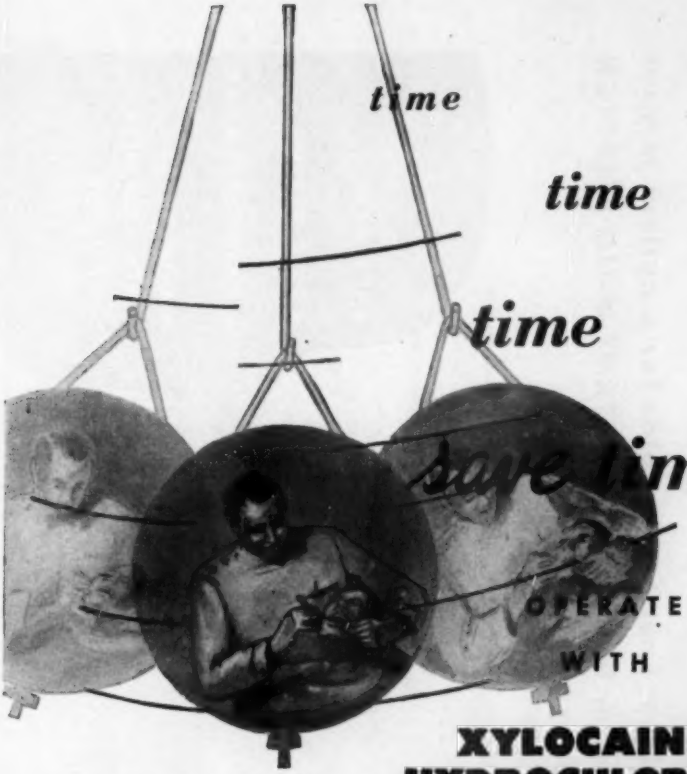

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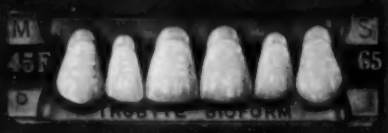

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